VOLUME 8

EXHIBITS

TRANSCRIPT OF RECORD

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1954

No. 162

UNITED STATES OF AMERICA, APPELLANT

vs.

E. I. DU PONT DE NEMOURS AND COMPANY

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

FILED JUNE 23, 1954

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56	11/24/41, Bulletin—Variety Bread Situation	130	4287
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111	3/9/39, Gorton Pew Fisheries Co.—Trade Report	243	4398
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115	Nov. '46, Extract—Frozen Foods Sales Test	250	4405
116	Sept. '48, Locker Management Article—What are the Better Wraps? What do they cost?	258	4413
117	1/26/48, A. D. Atterbury Co. Trade Report	262	4417
118	1/21/48, Snow Crop Marketers Trade Report	263	4418
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130	June '49, OFF's Annual Packaging Review	279	4434
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173	6/6/49, Great A. & P. Tea Co. Trade Report	352	4502
174	12/13/40, Busalacchi Bros. Trade Report	355	4505
175	Aug. 1940, Food Industries Article—Pliofilm for Meat, New Wrapper Solves Problem for Packers	356	4506
176	1/2/48, Wm. Temple Co. Trade Report	359	4509
177	3/22/33, A. J. Kasper Co. Trade Report	360	4510
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181	12/23/48, Duncan Coffee Co. Trade Report	364	4514
182	9/19/39, Chr. Hansen's Lab Trade Report	365	4515
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191	5/19/32 letter, O. F. Benz to L. A. Yerkes	381	4528
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193	7/18/34, Experiment—Cigarette Wrapping Materials	385	4532
194	7/16/37, Bulletin—Foil on Cigars	395	4542
195	8/2/37, Experiment—Foil v. Cellophane as a Cigar Wrap	398	4545
196	5/3/38, Bulletin—Cigar Protection	405	4552
197	1/13/39, Scotten-Dillon Co. Trade Report	407	4554
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199	2/27/39, Webster Eisenlohr Trade Report	411	4558
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206	2/4/48, Brown & Williamson Trade Report	425	4572
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216	2/21/49, Pepperell Mfg Co. Trade Report	445	4592
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287	Nov. 1940, Modern Packaging, Aluminum Foil Ad	523	4668
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289	Jan. 1930, Food Industries Article—Packaging Materials	525	4670
290	Mar. 1935, Food Industries Article—Wrappings	536	4681
291	8/5/37, Extract—Nat. Bureau of Standards Publication Permeability of Membranes to Water Vapor	539	4684
292	(No date), Modern Packaging Encyclopedia—Metal Foils	545	4690
293	May 1944, Modern Packaging Article—Vegetable Parchment	549	4694
294	Nov. 1945, Modern Packaging Article—Glassine	555	4700
295	1947, Paper Year Book Article—Waxed Papers	559	4704
296	1947, Paper Year Book Article—Glassine and Greaseproof	562	4707
297	1947, Paper Year Book Article—Bag Stock	567	4712
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328	12/13/44 letter, C. L. Blair to W. J. Harte	634	4775
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332	3/13/47 letter, C. F. Brown to T. L. Hines	638	4779
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371	2/7/47, Extract from Monthly Sales Report	693	4834
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373	8/22/47, Announcement of du Pont Price Changes and enclosures	697	4838
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384	8/25/50, Announcement of Increase in Converter Discount by du Pont	714	4855
385	8/25/50, Announcement of du Pont Price Changes	715	4856
386	1924-1950, Table—Du Pont Cellophane Production Statistics	716	4857
387	1950, Table—Du Pont Cellophane Technical Activities Expense	717	4858
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809	5/12/41, E. C. E. to Ducelex—Radiogram	1711	5504
810	5/19/41 letter, G. H. Andrews to E. C. E.	1712	5505
811	3/25/41 letter, J. M. Quinn to G. H. Andrews, et al	1713	5506
812	1/12/41 letter, H. D. Schemtob to E. I. du Pont Co	1714	5507
813	4/8/41 letter, G. H. Andrews to H. D. Schemtob	1715	5508
814	3/26/41 letter, G. H. Andrews to E. F. J. Nater	1717	5510
815	5/27/41 letter, W. D. Lauerman to G. H. Andrews	1720	5512
816	6/2/41 letter, G. H. Andrews to W. D. Lauerman	1721	5513
817	4/9/41 letter, G. H. Andrews to J. & M. Levy	1722	5514

Exhibit No.		Original	Print
818	7/10/41 letter, G. H. Andrews to W. A. Denker	1723	5515
819	6/20/41, Mees e Hijos Letter	1724	5516
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821	7/2/41, B. C. L. Invoice to Mees e Hijos	1726	5518
823	5/24/45 letter, G. E. Duncan to G. H. Andrews	1762	5522
824	11/6/47 memo, C. F. Brown to A. Kunsman	1765	5525
825	11/14/47, letter, G. H. Andrews to J. Cheung	1766	5526
826	12/18/47, Du Pont Invoice to On Lok Yuen Co	1767	5527
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828	5/7/48, letter, Du Pont Invoice to G. W. Sohlberg	1769	5529
829	10/7/47, letter, Fabrica Ultramarina to E. I. du Pont Co	1770	5530
830	11/12/47, letter, G H. Andrews to Fabrica Ultramarina	1771	5531
831	1/5/48, Du Pont Invoice to Fabrica Ultramarina	1772	5532
832	12/27/47, letter, W. N. McLennan to E. A. Wight	1773	5533
833	1/5/48, letter, E. A. Wight to W. N. McLennan	1774	5534
834	5/9/48, letter, Date Association to E. I. du Pont Co	1775	5535
835	5/20/48, Du Pont Invoice to Date Association	1777	5537
836	5/19/48, letter, Irma Food Factories to E. I. du Pont Co	1778	5538
837	10/5/48, report, C. F. Brown to J. E. Dean	1779	5539
838	10/29/48, letter, G. de Wulf to E. I. du Pont Co	1780	5540
839	11/5/48, letter, G. H. Andrews to Papeteries Vencedor	1781	5541
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847	5/19/49, letter, S. L. Seaman to G. H. Andrews	1790	5549
848	5/18/49, Du Pont Invoice to Seaman & Seaman	1791	5550
849	5/18/49, Du Pont Invoice to Seaman & Seaman	1792	5551
850	8/29/49, letter, Heintz Van Landewyck to G. H. Andrews	1793	5552
851	9/6/49, Du Pont Invoice to Heintz Van Landewyck	1794	5553
852	10/11/49, Du Pont Invoice to Heintz Van Landewyck	1795	5554
853	10/28/49, letter, F. Thrane to G. H. Andrews	1796	5555
854	12/3/49, letter, O/Y ULKO A/B to E. I. du Pont Co	1797	5556
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Defendant's Exhibit No. 745

RECEIVED AUG 31 1923

July 31, 1923.

Mr. W. B. Banker,
Construction Division.

OUR FILE WRH - PROJECT 12101
CELLOPHANE - PELLICULE MACHINES

I am requesting Mr. Baxter of your Division to make out requisition for two hoppers for the Pellicule Machines. These are to be ordered from the La Cellophane Company at Bezons, France in accordance with agreement at a conference held in this office, when Messers W. C. Sprunce, L. A. Yerkes, Henry Blum, Edwin Brandenberger and the writer, while Mr. Brandenberger was in Wilmington, the reason for placing this order with the La Cellophane Company being, that certain changes had been made, and the feeling was that they could be incorporated to a better advantage without any doubt or misunderstanding.

We gave Mr. Brandenberger a copy of our drawing W-8817 which showed the dimensions of the side frames, bearings for the journals on the hoppers to which he agreed to work.

Will you kindly have this requisition sent through to Mr. Yerkes, asking if they would send this through for us, or whether we should correspond with the La Cellophane Company direct?

When you receive this memo, I will appreciate it if you will call me on the phone, in order that you may be able to discuss this matter while at Buffalo this week.

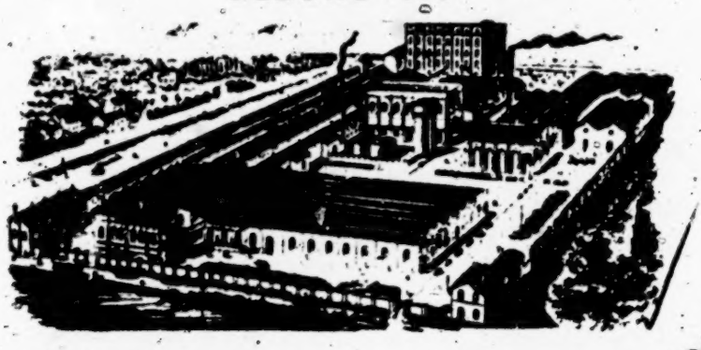
OPERATIVE ENGINEERING & DESIGN DIVISION,
W. R. Hope.

WRH:WEM

Defendant's Exhibit No. 746

La Cellophane

BEZONS (S.&O.)



SOCIÉTÉ ANONYME CAPITAL FR. [illegible]
SIÈGE SOCIAL
[illegible] RUE DU LOUVRE, PARIS
TÉL. OUT 18-63

MAGASIN DE VENTE
ET D'EXPOSITION
[illegible] RUE DE LA CHAUSSÉE D'ANTIN
PARIS
TÉL. TRUDAINE 63-13

TÉLÉPHONE: WAGRAM [illegible]
Lieber's Code
Code ABC 5 th

Bezons le 8/9/ 1923

File-12101 Pellicule machine-

Not P. Cabled to Cullen 1/2 gr 3 WRH

DU PONT ENGENERING Cy

WILMINGTON

Delaware U.S.A.

Attention de M. WALTER HOPE.

PELLICULE MACHINE DRYER.-

Sir,

I have just finished a study of the pellicule machine dryer for N.3 machine with Mr BRANDENBERGER. It is conclusively proven to Mr BRANDENBERGER that the best combination for dryer rolls is ébonite for all top rolls and 80 lead 20 antimony for all bottom rolls : rolls to be of the same size as at present. The first 19 top rolls and [illegible] bottom rolls from the wet end of the dryer are to be longer than the remaining rolls. This phase was discussed with you in a recent letter.

BEZONS

L'importation de la Cellophane aux États-Unis est interdite sous peine de poursuites judiciaires et des dommages-intérêts

Zinc rolls after comparatively short service, flake off and the repair cost is correspondingly high.

Mr BRANDENBERGER is preparing to build two new pellicule machine with dryers ; this will give him six in all. He contemplates constructing the rolls for both dryers as above outlined

This letter might reach you too late for consideration in connection with dryer rolls for the first pellicule machine, from the consensus of opinion here, it would certainly to be our advantage to substitute for zinc covered rolls, as many lead & antimony covered ones as possible.

It has been found better not to heat with hot water the four last bottom rolls nearest the dry end of each dryer. The pellicule when rolled warm retains its heat for some while. It is better to allow it to pass over four cool rolls before being rolled.

Yours very truly

R E. Cullen

Defendant's Exhibit No. 747

D-747

Copy to: Mr. L. A. Yerkes, President,
Du Pont Fibersilk Co.
Buffalo, New York.

Col. W. C. Sprunance,
Building -

August 13, 1923.

Mr. R. E. Cullen,
Hotel McAlpin,
New York City, N.Y.

OUR FILE WRE - PROJECT 1210:
CELLOPHANE - MISCELLANEOUS

Dear Sir:

Complying with your request of August 6th, and your telegram of the eighth, we are handing you herewith one blue print of each of the following drawings:

Chemical House

B-8845 - B-8849
B-8846 B-8850
B-8847 B-8851
B-8848 B-8852 - these being the general arrangement of the Chemical Building. For your information, these are now being checked, and while there may be a few minor details omitted, we believe these arrangements will answer your purpose.

Pellicule Machine

B-8870 (being incomplete arrangements of the wet end of the
B-8872 machine. We are awaiting information from Besons re-
B-8873 garding a study they are making, and they stated in their letter of July 13th to Col. W. C. Sprunance that they hoped to have their study completed ready to send within two weeks from that date. It may be possible that this letter will arrive after your departure. These arrangements embody all of the changes which were suggested in their memo addressed to the writer from their Mr. Biblier sent to us on July 13th.)

B-8880. (These drawings illustrate the arrangement of the dryer
B-8881 for the Pellicule Machine, and are made in strict ac-
B-8882 cordance with the latest practice at Besons, except,
B-8883 instead of two fans at the top and bottom circulating
B-8884 ducts, we have used one in each place, maintaining the
B-8885 regulation of the air by means of dampers. This makes a more economical arrangement than having two fans, top and bottom, as shown on the La Cellophane drawings which we have. We discussed this with Mr. Brandenberger when in Wilmington, and he agreed to this arrangement.

FILE COPY

To Mr. R. E. Callen, Hotel McAlpin, New York, N.Y. August 14, 1923.

In addition to the above arrangements for this machine, we are sending the arrangements of tanks 2 - 3 - and 4 - B-8874 and tank #5 -B-8887.

While you requested only arrangement drawings, we are giving you one set of the following blue prints, covering the details of the rolls, as there are one or two questions which we would like you to discuss with Mr. Brandenberger.

Details:

19082 - -	19086
19083	19087
19084	19116

In addition to the foregoing list of drawings, we are giving you herewith copy of letter from Mr. E. Brandenberger, addressed to Mr. W. C. Sprusance, Vice President, dated July 12th, to which is attached copy of memo entitled "Answers to Mr. Hope's questions." signed Biblier, engineer, and copy of report therein referred to.

By referring to Item #3 under "Answers to Mr. Hope's Questions." you will notice they specify changing the diameter of the large roll of the Coagulating Bath to 270 m/m or 10-5/8" dia. instead of 13.326 which they originally had, and which we have worked to, their reason for desiring this change being to permit a peripheral velocity 12% slower than the machine. As it will enable us to use standard pipe, and materially reduce the cost of this roll, to maintain the diameter as originally called for, we can obtain this desired velocity by means of the gear drive which we have provided, so that various speeds may be obtained for this roll, as suggested by Mr. Brandenberger while in Wilmington.

There is one other point we would like to have you discuss and this is regarding the method of placing the ends in the bottom rolls of the dryer. By referring to drawing 19086 you will see this roll is made up of the standard pipe bored on the inside 1-½" from the end to receive a cast iron ring, this cast iron ring being riveted into position. This ring has a number of tapped holes on the face, so that the end of the roll, which also forms the journal, can be bolted to it, having a gasket between the two surfaces. This is the method shown on the drawings we obtained from Bezons. Due to the hot water circulating through these rolls under pressure, we are of the opinion that they may have had some difficulty in keeping the rolls from leaking, where the ring fits into the tube, even though it is a drive fit.

We are therefore submitting Detail 19116 which shows the suggested change, consisting of inserting instead of the cast iron ring, a cast steel ring which would be welded to the inside of the tube, this to be tapped with tapped bolts for bolting the end of the roll.

Further, in connection with the details of these rolls, we may add that the length of journal machine shown has not been

~~Defendant's Exhibit No. 747~~

To: Mr. H. E. Cullen, Hotel McAlpin, New York, N.Y. August 18,1928

shortened to the reduced length which will be necessary, on account of the change of top frame suggested by Mr. Bibler in his report above referred to.

We are also handing you herewith blue print of preliminary drawing showing the arrangement of the Viscose Ripening Room and also Acid Storage -W-8896 - W-8897, Coagulating Bath W-8884 - W-8889 - W-8893 - W-8894 - W-8895 and 1/16" scale layout of the Factory Building.

All of the drawings given you herewith are for your information, and in as much as they are not entirely complete, it may be confusing to leave these drawings at Besono, but as soon as they are completed and checked, we will send complete drawings to Mr. Brandenberger so that they may be able to see just exactly how we are proceeding with this work.

Since writing the above, we have received communication from Mr. Brandenberger with reference to the Coagulating Bath tank and some other changes.

Yours very truly,

ENGINEERING DEPARTMENT,
H. R. Hope.

WRH:MEN

FILE COPY

Defendant's Exhibit No. 748

Bezons, France
8/20, 1920

File (P) Aug 12/81
Pellicul Machine
N.A.R.

Allophane

Du Pont Engr Co.,
Wil, Del.

Attn Walter Hope

Dear Sir:—

Mr. Brandenberger has been watching the operation of #3 Pellicule machine quite closely the past three months. The Fibrosilk Co's machines are patterned after #3. It has been convincingly proven now that the elevation of the upper rolls over tanks 4 to 14 inclusive, is not satisfactory from an operating viewpoint. The pellicule has trouble in traveling this distance and on carefully weighing the results to date, Mr. Brandenberger has decided that the upper rolls over tanks 4 – 14 incl. should be at the same elevation as the upper rolls over tanks 2, 3 & 15. All squeeze rolls should be dropped correspondingly. I have called you [illegible]

[illegible]

[illegible]

Defendant's Exhibit No. 749

Sept 7 1923
Bezons Fran

DuPont Eng. Co. File Pmg 12101 Pellicule Machine NAR
Wil. Del

Attn Walter Hope

Sir: I am enclosing herewith one B/p of map "Séchoir de la MP III SLC" that shows rolls with sizes, as used in pellicule drying machine for #3 machine

Mr Brandenberger desires me to suggest that rolls marked by me in yellow 1, 2, 3, 4 + 5 be made of the same size as roll marked B and that they be covered with Ebonite that rolls marked in red 6, 7, 8, 9, + 10 be made of the same size as roll marked A, and be covered with zinc.

This suggestion will give 19 - Top Rolls of one size from the wet end of dryer, all covered with Ebonite, and 20 Bottom rolls of one size from the wet end of the dryer [illegible]

[illegible]

This suggested change prevents rolls causing a bad edge on pellicule when shrinkage in dryer does not take place as quickly as desired, or when film due to uneven thickness, does not travel along the ℄ of the rolls. Remaining rolls in dryer remain unchanged as shown on enclosure

RSR

Defendant's Exhibit No. 750

DU PONT FIBERSILK COMPANY
INCORPORATED
BUFFALO, NEW YORK

October 17, 1923.

Mr. H. M. Pierce, C. E.,
Du Pont Engineering Co.,
Wilmington, Del.

Dear Sir:

YOUR FILE WRH - PROJECT 12101 - PELLICULE MACHINE
OCTOBER 8, 1923

Attention Mr. W.R. Hope

Before leaving the plant of La Cellophane in France the 29th of September, the writer noticed that a number of the rolls in the storeroom contained what appeared to be yellow brass journals. The drawings which you gave me when I left for France showed axles to be of steel. Mr. Biblier had approved these drawings in detail and I so advised you. Feeling that some misunderstanding certainly had taken place, I asked Mr. Biblier to visit the storeroom with me and on checking up the placement of the brass journal rolls I found that a number of rolls in the pellicule machine containing brass journals were as per my cable to you. The brass journals are quite an important factor and Mr. Brandenberger as well as his assistants are of the opinion that under no conditions should other substitutions be used. Since arriving here, I have talked over the brass composition with Mr. Brehm, metallurgist with the Unique Brass Foundry, 841 Grant St., Buffalo, N.Y. and Mr. Bacon. The consensus of opinion is that the bronze bearings should be composed of 88% copper, 10% tin and 2% lead or 86% copper, 12% tin and 2% lead. The metal alone in the latter should cost about 18½ cents per pound. Either should make a bearing that would give very satisfactory wearing conditions as well as being resistant to the action of the different baths. For the journals, two alloys are recommended, either 85% copper and 15% tin or 85% copper, 12% tin and 3% nickel. The latter should be slightly better than the former. The metal alone in it would cost between 20 and 21 cents per pound.

The report which you and Mr. White made called for steel journals for the lower rolls of the pellicule machine. This, however, was an error. Can you cancel the order on machine steel for the lower rolls? If not, can it not be used up in connection with the construction of other machinery? Would suggest that the brass be ordered for the rolls as quickly as possible.

Yours very truly,

SUPERINTENDENT.

REC'D

Defendant's Exhibit No. 731

DU PONT FIBERSILK COMPANY
INCORPORATED
BUFFALO, NEW YORK

October 19, 1923.

Subject: CELLOPHANE - REQUISITION No. 1½ CCC

Mr. H. M. Pierce, C.E.,
Du Pont Engineering Co.,
Wilmington, Del.

Dear Sir: Attention Mr. W. R. Hope

Requisition No. 1½ CCC calls for but two (2) pellicule machine hoppers, as per specifications. Inasmuch as we will install two (2) pellicule machines under the initial appropriation, two hoppers will not be sufficient. Three hoppers are required for two machines. Will you therefore pass through alteration to Bezons, France asking that the third hopper be forwarded also ?

The nickel jaws of each hopper are tested by applying a perfect straight edge. The one used at Bezons for this purpose is of excellent workmanship and well suited for this work. I have checked up with our Purchasing Department and find that a perfect straight edge is obtainable in America but on considering further it appears advisable to request that one straight edge for testing upper jaws be ordered from Bezons, shipment to be made at the same time as the hoppers are forwarded. I mentioned this to Messrs. Brandenberger and Bleibler before leaving their plant so that they will be familiar with what is desired. Will you pass through the necessary order at your early convenience?

Yours very truly,

SUPERINTENDENT.

REC R

Defendant's Exhibit No. 752

TRANSLATION OF COPY OF LETTER SENT FROM LA CELLOPHANE COMPANY IN BEZONS FRANCE TO E. I. DUPONT DE NEMOURS CO. PURCHASING DEPARTMENT.

CC MR. SHACKLEFORD
MR. CULLEN

Bezons, France,
December 11th. 1928.

E. I.
DuPont de Nemours & Co.,
Wilmington, Del.

Attention Purchasing Department

Gentlemen:

Referring to the different orders which you have given us we have the pleasure of confirming them as follows:

TREMIES: Your order Req. 1 1/2 CCC: two tremies.

We will be able to deliver one on the 15th of January, the second toward the end of February.
Your order No. 53,083-JReq.No.44 1/2-CCC: one tremie.
Delivery date: the end of May

CUTTING MACHINE Uour order No. 56,159-J Req. No.73 1/2-CCC
The price of this machine has been set by the manufacturer, the firm of Ezbelent, 80 Rue de Belleville in Paris, at ( ) 11.600 francs
Delivery date: March 15th.

It is understood that the supports of the razor blades will be of construction to fit Gillette blades.

One steel straight edge to test the casting hopper jaws
Your order No. 52,095-J, Req. 39 1/2-CCC; order entered by your London office (letter No. 8, 267 of November 29th.
The price for this straight-edge is set by the manufacturer the firm of Durand, 20 Rue St. Fargeau in Paris, at ( ) 925 francs.
Shipment: 15th of January with one of the tremies.

EMBOSSING MACHINE: Your order entered by cable, signed Cullen: Could Repiquet ship within three months Cellophane embossing machinelike yours with silk engraved roll, and counterpart for price not more than nineteen thousand francs answer."

The price of this machine has been set by the manufacturer, the firm of Repriquet, 18-20 Rue de La Folie-Regnault in Paris, at ( ) 13,500 francs. Delivery date: sometime in March.

Following recent instructions given by Mr. Yerkes, we are engaged in the engraving of a steel cylinder the same as the engraving of our SILK roll; this engraving will be a special fabrication, but will not exceed the price of 1,000 francs. ( )

E. I. DuPont de Nemours & Co.,
#2. CC TO MR. SHACKLEFORD AND MR. CULLEN

We are waiting for a confirmation of the order and shipping instruction.

All of our shipping dates are given approximately, of course, and we will hold to them if those from whom we are buying hold to their word.

We will not fail to watch the execution of these orders carefully as if they were intended for our own plant.

Please accept, gentlemen, our sincere regards, etc.,

TRANS. BY REC
1-4-28
Buffalo-

Defendant's Ethibit No. 753

CLASS OF SERVICE
Telegram
Day Letter
Night Message
Night Letter
If the class of service is desired this message will be transmitted as a full-rate telegram.

COPY OF
WESTERN UNION TELEGRAM

Wilmington, Delaware, January 21, 1934.

E. Brandenberger, Directur General,
de La Societé "LA Cellophane",
16 Rue du Louvre,
Paris, France.

CABLEGRAM

Having trouble making Eighty Percent Lead and Twenty Percent Antimony rolls Stop Cable if percentage of antimony can be less, also formula for the alloy, temperature when pouring, and temperature of mold. Would Four to Six Percent Tin be detrimental? Hope.

H.M.Pierce.
(duPont Co.)

HMB-MAT
Charge:-
DuPont Cellophane Company
Construction-Buffalo
C-1-ED - Cellophane Plant(12101)
(Engr-C).

CLASS OF SERVICE DESIRED

Telegram	
Day Letter	
Night Message	
Night Letter	

Patrons should mark an X opposite the class of service desired; otherwise the message will be transmitted as a FULL-RATE TELEGRAM

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

Number	
Check	
Time Filed	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Wilmington, Delaware, January 25, 1924.

Mr. E. Brandenberger, Director General,
La Cellophane,
Bezons, France.

Refer our cable January twenty-first. Failure to cast rolls of twenty percent antimony and eighty percent lead delays completion pellicule machine. Stop. Castings porous. Stop. Cable immediately whether lower percent antimony possible, also your exact formula alloy and temperatures of mold and pouring metal. Stop. How much tin can be used in alloy. Stop. Advise whether any peculiar conditions necessary for successful casting.

W.R.HOPE

E. M. PIERCE

Charge: Du Pont Engineering Co.
Du Pont Cellophane
C-1-ED

CLASS OF SERVICE	SYMBOL
Telegram	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a telegram. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT — GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

Form 1206

CLASS OF SERVICE	SYMBOL
Telegram	
Day Letter	
Night Message	
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a telegram. Otherwise its character is indicated by the symbol appearing after the check.

RECEIVED AT

2WI D 127
BFZONS 27 24
NLT DUPONT ENGRINEERING
WILMINGTON (DEL)

CANNOT ACCOUNT FOR YOUR TROUBLE CERTAINLY DUE TO INSUFFICIENT HEATING OF MOULD OR ALLOY BEFORE POURING STOP WE HEAT IN OVEN MOULD CONTAINING ROLLS 250 TO 300 CENTIGRADES TEMPERATURE FOR FIRST POURING DURING ONE NIGHT STOP FOR FOLLOWING POURING WE UNMOLDED AND RELOAD QUICKLY TO AVOID COOLING OF MOULD THEN HEAT MOULD DURING TWO HOURS IN OVEN WHICH IS TO SAY DURATION OF HEATING BETWEEN TWO POURINGS IS TWO HOURS STOP TEMPERATURE OF ALLOY IS OF 430 TO 450 CENTIGRADES WHEN SURFACE BECOMES DEEP BLUE IT IS TIME FOR POURING YOU CAN WITHOUT INCONVENIENCE EMPLOY ANY OTHER ALLOY IN WHICH LEAD IS PROMINENT PROVIDED SURFACE IS HARDER THAN LEAD ALONE STOP CULLEN STUDIED OUR ALLOY AT BFZONS AND CAN GIVE USEFUL INFORMATION.

CEILOPHANE

735a

XXXXRELOADxxxx

Defendant's Exhibit No. 754

DU PONT CELLOPHANE COMPANY, INC.
BUFFALO, N. Y.

February 14, 1924.

Mr. H. M. Pierce, Pres.,
du Pont Engineering Co.,
Wilmington, Del.

Dear Mr. Pierce:

As you know, the hoppers for the #1 and the #2 pellicule machines, as well as one spare hopper, have been ordered from France. The first hopper was shipped February 6th and should be in Buffalo in the next few days. We have cable information this morning that the #2 hopper will be shipped March 15th. They are writing us as to just when the #3 hopper will come forward.

I understand that these hoppers must be very accurately made and on account of their accuracy are quite apt to get out of adjustment, which means immediate replacement by spare hopper. It was my understanding with Mr. Hope that these three hoppers would be ordered in France and that just as soon as the first arrived in Buffalo detailed drawings would be made so that we would be in a position to manufacture our own hoppers in this country.

We have recently authorized you to construct a third pellicule machine. It seems to me unnecessary to order the hopper for this machine in France unless, after an examination of the first hopper received, we come to some different conclusion.

Undoubtedly Mr. Hope obtained, while in France, all of the drawings which they have of the hoppers so that by comparing these prints with the hopper itself when received we should have no difficulty in making our own detailed drawings and specifications. Won't you please ask Mr. Hope to forward us one complete set of the drawings which he probably has so that we can study them with the hopper itself? We will then probably wish to go over the matter with Mr. Hope or whoever you designate and will advise you by letter or wire. As the #1 hopper has been built and adjusted carefully in the French shops, it seems to us inadvisable to dismantle it and hope that this will not be necessary in order to get complete drawings for ourselves. We would like to have your views, as well as Mr. Hope's, on how best to handle this subject. My understanding is

DU PONT CELLOPHANE COMPANY, INC.
BUFFALO, N. Y.

H.M.P. -2- Feb. 14, 1924.

that the jaws of the hopper are made of a nickel alloy and of course must be very accurately ground and polished. This is undoubtedly the most difficult detail of the construction. Your views will be appreciated.

Yours very truly,

PRODUCTION MANAGER.

MduPL:R

CC to Mr. Shackelford

Defendant's Exhibit No. 755

DU PONT CELLOPHANE COMPANY, INC.
BUFFALO, N. Y.

February 26, 1924.

Du Pont Engineering Co.,
Wilmington,
Delaware.

Gentlemen: Attention MR. W. R. HOPE

Subject: PELLICULE MACHINE CASTING BLOCK - PROJECT 12101

Your communication of February 22nd.

The lips of the casting hopper of the pellicule machine are as near pure nickel as is obtainable commercially. Specifications under which the last lips were purchased at Bezons are as follows:

Nickel	- 99.35
Copper	- 0.12
Manganese	- 0.28
Iron	- 0.32
Silica	- 0.01

In 1914 lips of the following analysis were used:

Nickel	- 97.97
Copper	- 0.08
Manganese	- 1.52
Iron	- 0.35
Silica	- 0.06

but these lips did not stand up under operating conditions as well as the first analysis given.

The experience at Bezons is that a set of lips with careful dressing will last from 4 to 5 years The greatest care must be taken of them whether in use or not in use. When in use they may last from 3 days to 5 months; in fact, by improper manipulation of the control wheels a set of lips might be ruined in the first few minutes of operation.

DU PONT CELLOPHANE COMPANY, INC.,
BUFFALO, N. Y.

While at Besons we made a careful study of the operation and repair of the casting hopper and will be glad to give your Mr. Poinsett on his arrival here any information we have available.

Yours very truly,

Robert E. Cullen,
SUPERINTENDENT

REC:R

Defendant's Exhibit No. 756

DU PONT CELLOPHANE COMPANY, INC.,
BUFFALO, N. Y.

March 31, 1924.

N.A.R.
Proj. 12101
Pellicule

Mr. H. M. Pierce, President,
du Pont Engineering Company,
Wilmington, Delaware.

My dear Mr. Pierce:

Mr. Brandenberger arrived this morning together with his three operators and the boys whom we sent over to France to learn the operation of the casting machine, etc. I have talked with Mr. Brandenberger with regard to the plant so far as he has seen it in the last few hours and he is very much pleased. The machine, he thinks, is fine and with one or two exceptions is, as far as he knows, quite ready to run. The changes which he wants made immediately are quite minor and Mr. Shackelford will probably have them done by tomorrow night.

There is one thing which he recommends and which is quite radical; viz. that no heating coils, hot air ducts or circulating fans together with their incidental details, be installed on the dryer of the #3 machine. He states that the latest machine in France consists of a series of drums heated by hot water and supported on a cast iron frame similar to the frame on our machine. They find no necessity for the hot air circulation. Won't you please ask Messrs. Banker and Hope to cancel all material for this hot air circulating system on the #3 machine ? Mr. Shackelford has already been requested to cancel whatever details he has ordered in Buffalo.

I am inclined to think that the cast iron frame work for supporting the rolls, etc. should be drilled and finished so that the duct work can be added with a minimum of cost if it is ever found necessary, although I think there is little or no likelihood of ever wanting it. Mr. Brandenberger is very positive on the subject.

I think the concrete pit under the machine which acts as a return air duct and in which the lower fan is installed, should be put in by Mr. Shackelford. If, later on, we find that the pit is actually not needed, it can be filled up and floored over.

In spite of the fact that Mr. Brandenberger is so positive that the warm air is not needed, he recommends that we do our own experimenting to prove to our own satisfaction that hot water is just as good as hot air. Therefore, I am not entirely sure that we shall not find hot air preferable for some reason or other; hence I think we are warranted in putting in the concrete pit

DU PONT CELLOPHANE COMPANY, INC.
BUFFALO, N. Y.

but cancelling all other equipment in connection with the hot air circulation for the #3 machine, as it can be bought and installed later, if needed. It would, however, be a very difficult matter to construct the pit after the machine is partly or wholly erected.

Mr. Shackelford understands thoroughly what we want and will take care of his end of the work. Won't you please see that the motors, etc. which the Wilmington office has ordered are cancelled at once and the designs for the #3 machine revised accordingly ? This will make quite a little saving in the cost of the #3 installation.

If all of the above is not clear to you, please wire us so that all possible orders can be cancelled promptly.

Yours very truly,

PRODUCTION MANAGER.

MduPL:R

CC: Mr. Shackelford
Mr. Cullen
Mr. Bacon

Defendant's Exhibit No. 737

DU PONT CELLOPHANE COMPANY, INC.
BUFFALO, N. Y.

April 2, 1924.

Mr. F. A. Wardenburg, Vice-President,
Du Pont Engineering Company,
Wilmington, Delaware.

Dear Mr. Wardenburg:

As you probably know, we have been making Cellophane for the past two days. Some is very excellent quality; some is not so good and must be dried within a comparatively few hours after it is produced or it is worthless. It is a pity not to be able to salvage this material by running it through a dryer and making it saleable. We have had this question up with Mr. Shackelford and he is working night and day to complete the gluing and drying machine so far as its drying features are concerned. He hopes to have it done some time tonight, which is quite satisfactory. I believe, however, he is robbing the #2 casting machine in order to accomplish this and in consequence the material for the gluing and drying machine itself should be gotten to us at once in order that the #2 casting machine may not be held up.

The dyeing features of the gluing machine will not be completed, according to Mr. Shackelford's schedule, until about April 10th. By that time our forecast shews that we will have more than 100 rolls of Cellophane which cannot be sold or handled without dyeing. We therefore need the dyeing apparatus just as soon as it can be finished and have asked Mr. Shackelford to take all these questions up with you by wire so as to impress upon the Wilmington Shops our situation.

The #1 casting machine is running very nicely from a mechanical point of view and producing excellent results. We, of course, have been obliged to make some changes here and there in speeds, etc. to accomplish this and Mr. Shackelford has been requested to keep you posted on these for the benefit of the second and third machines. I am advising Mr. Shackelford of the changes we make for this purpose.

I mentioned above that parts of the #2 casting machine were being borrowed for use on the dryer. It is of the utmost importance that the #2 casting machine be finished on schedule time. Our French friends, who are assisting in the operation of the #1 machine, expect to return home towards the end of April and it will be of the greatest advantage to us if they can be present when the #2 machine is started, as there is no question but that it will be brought up to capacity much quicker with their help than if we are on our own resources.

DU PONT CELLOPHANE COMPANY, INC.,
BUFFALO, N. Y.

I hope that from the above remarks you can appreciate our situation both with regard to the #2 casting machine as well as the gluing, dyeing and drying machine, also the vaporizing and embossing machines. All of this apparatus is very essential and we will appreciate greatly anything that can be done to get it to us and in service at the earliest date.

Yours very truly,

W. du Pont

PRODUCTION MANAGER.

MduPL:R

CC: Mr. W. Shackelford, C.S.

Defendant's Exhibit No. 758

E. I. DU PONT DE NEMOURS & CO.
INCORPORATED

ADVICE OF ACTION

March 19, 1941

Copies to Mr. H. C. Haskell
Mr. W. R. Swint
Dr. Fin Sparre
Mr. W. F. Raskob
Mr. G. V. Wolstenholme
Mr. A. C. Nielsen
Dr. R. E. DeRight

Mr. B. M. May, A. G. M.,
Rayon Department

SUBJECT: CANCELLATION OF FOREIGN TECHNICAL AGREEMENTS RE MANUFACTURE OF VISCOSE RAYON YARN AND FIBERS, REGENERATED CELLULOSE FILM, AND CELLULOSE CAPS AND BANDS:

ACTION TAKEN BY Executive Committee

AT MEETING HELD March 19, 1941

REMARKS

Referring to your letter of March 17th in connection with cancellation of above-mentioned agreements with the following concerns:-

1) Comptoir des Textiles Artificiels (France) re viscose rayon yarn and fibers;

2) LaCellophane Societe Anonyme (France) re regenerated cellulose film;

3) Societe de la Viscose Francaise (France) re cellulose caps and bands;

4) Kalle & Co., A. G. (Germany) re regenerated cellulose film.

After discussion, it was moved and unanimously carried that this letter be ordered filed, and that the Rayon Department be authorized to send letters to the Comptoir (for themselves, La Cellophane and Societe Francaise), and to Kalle, relating to cancellation of aforesaid technical agreements, said letters to be in form substantially as per copies submitted with Mr. May's letter and to be approved in each case by the Legal Department.

W. D. Fisher
Sec'y, Executive Committee

16

M 3459

Charge to the account of DU PONT RAYON COMPANY $

CLASS OF SERVICE DESIRED
DOMESTIC: TELEGRAM, DAY LETTER, NIGHT MESSAGE, NIGHT LETTER
CABLE: FULL RATE, DEFERRED, NIGHT LETTER, SHIP RADIOGRAM

WESTERN UNION

CHECK
ACCT'G INFM.
TIME FILED

NEWCOMB CARLTON, CHAIRMAN OF THE BOARD — J. C. WILLEVER, FIRST VICE-PRESIDENT — E. N. WHITE, PRESIDENT

Send the following message, subject to the terms on back hereof, which are hereby agreed to

NEW YORK MAY 8 1935

CHASE
LADUPONTAL
PARIS

YOUR LETTER APRIL THIRTIETH DEFINITELY NOT INTERESTED

WRITING

YERKES

Copy to: [redacted]
Foreign Relations Dept.
London Office

4 3475

WESTERN UNION GIFT ORDERS SOLVE THE PERPLEXING QUESTION OF WHAT TO GIVE

5446

1622

Defendant's Exhibit No. 764

Defendant's Exhibit No. 767

THIS AGREEMENT, made as of the 19th Day of August, 1948, by and between

E. I. DU PONT DE NEMOURS AND COMPANY, a corporation organized and existing under the laws of the State of Delaware, United States of America, with its principal place of business at Wilmington, Delaware, hereinafter referred to as DU PONT,

and

CANADIAN INDUSTRIES LIMITED, a corporation organized under the Companies Act of the Dominion of Canada, with its principal place of business at Montreal, Quebec, hereinafter referred to as C.I.L.,

W I T N E S S E T H, That:

WHEREAS, the parties hereto and Imperial Chemical Industries Limited (a corporation organized and existing under the laws of Great Britain, hereinafter referred to as I.C.I.) entered into an agreement dated December 1, 1936 relating to patent rights and technical information (which agreement, with any and all amendments thereto and supplements thereof, is hereinafter referred to as the Tri-Party Agreement); and

WHEREAS, DU PONT and I.C.I. have terminated their respective rights and obligations under the Tri-Party Agreement vis-a-vis each other as of June 16, 1948; and

WHEREAS, DU PONT has proposed and C.I.L. has agreed to terminate their respective rights and obligations under the Tri-Party Agreement vis-a-vis each other as of the date hereof and to substitute the rights and licenses hereinafter granted in lieu of all rights and licenses granted one to the other pursuant to the Tri-Party Agreement;

M 3920

NOW, THEREFORE, for and in consideration of the mutual understandings and obligations herein set forth, the parties hereto agree as follows:

ARTICLE I

All rights and obligations as between DU PONT and C.I.L. under the Tri-Party Agreement are hereby terminated. Furthermore, all existing rights and licenses granted pursuant to the Tri-Party Agreement by DU PONT to C.I.L. and all existing rights and licenses granted pursuant to said agreement by C.I.L. to DU PONT are hereby cancelled and terminated.

ARTICLE II

(a) DU PONT hereby grants to C.I.L. a license (with the unrestricted right to sublicense) under the Canadian patents listed in attached Schedule A, under the Canadian patents issuing on the applications also listed in attached Schedule A or on any division of any such application, and under any and all reissues of any of said patents. Subject to all prior commitments to third parties, all of said licenses shall be exclusive except for the right to DU PONT to make, use and sell and to sell for use under the licensed patents and the right of DU PONT's licensees under any corresponding United States patents and of customers of DU PONT and of such licensees to sell and to sell for use under such Canadian patents.

(b) Upon receipt by DU PONT of a request in writing from C.I.L., DU PONT (unless prohibited by any prior commitment) shall by written instrument grant to C.I.L. a non-exclusive license under any Canadian or Newfoundland Patent

M3320

(other than a patent licensed pursuant to paragraph (a) of this Article) now or hereafter owned by DU PONT that claims (1) any product recited in Schedule B as hereto attached or as hereafter amended pursuant to Article VI hereof, (2) any process of making any such product or (3) any use of any such product.

(c) DU PONT hereby grants to C.I.L. a non-exclusive license to sell under all United States patents now or hereafter owned by DU PONT claiming the product so sold, that correspond in subject matter to any Canadian patent licensed to C.I.L. pursuant to paragraphs (a) or (b) of this Article.

ARTICLE III

C.I.L. hereby grants to DU PONT a non-exclusive license under the United States patents listed in attached Schedule C, under the United States patents issuing on the applications also listed in attached Schedule C or on any division of any such application, and under any and all reissues of any of said patents.

ARTICLE IV

Neither party has any right itself to file or prosecute any patent application of the other party, except that C.I.L. shall, at its own expense, prosecute the patent applications listed in attached Schedule A.

ARTICLE V

(a) Except as prohibited by any prior commitment, DU PONT shall make available to C.I.L. such of DU PONT's technical information, as C.I.L. may request, concerning the

M3320

manufacture or use of the products recited in Schedule B (as hereto attached or as hereafter amended pursuant to Article VI hereof) as may be required by C.I.L. in its manufacturing and selling operations or in the normal development and expansion of such operations.

(b) DU PONT hereby grants to C.I.L. the unrestricted, non-exclusive, territorially-unlimited right to use and employ in C.I.L.'s own manufacturing and selling operations all technical information conveyed to C.I.L. by DU PONT either heretofore pursuant to the Tri-Party Agreement or hereafter pursuant to paragraph (a) of this Article. Furthermore, C.I.L. may disclose any such technical information to any party whatsoever after ten (10) years from the date of receipt thereof or at such earlier time as it becomes published or otherwise available to the public. However, within ten (10) years from the date of its receipt C.I.L. may not disclose to I.C.I. or any other party any such technical information not published or otherwise available to the public; provided that, during such ten (10) year period, in disposing of its own technical information, or other technical information that it is free to disclose, to any party other than I.C.I., C.I.L. may include any technical information received from DU PONT that is inseparably intermingled therewith. Nothing in this Article V shall be construed to grant any right or license under any patent.

M3320

ARTICLE VI

It is contemplated that attached Schedule B will be amended from time to time by adding thereto products, not heretofore manufactured by C.I.L., as may then be agreed upon by the parties. It is further contemplated that the products so added will be products that C.I.L. is manufacturing at the time of such amendment or expects, in the normal development and expansion of its operations, to be manufacturing shortly thereafter.

ARTICLE VII

As promptly as practicable and periodically thereafter the parties shall review and evaluate the benefits enjoyed by each as a result of licenses granted by the other either pursuant to the Tri-Party Agreement or pursuant to this agreement and put into practice on or after January 1, 1946, and shall pay to the other adequate and justifiable compensation for all rights so received; provided that full compensation for any patent license or technical information hereafter conveyed pursuant to Articles II or V hereof and the manner of payment thereof may by mutual agreement between the parties be fixed in advance at the time of such conveyance.

ARTICLE VIII

(a) Either party may at any time terminate any license with respect to any patent licensed to it pursuant to this agreement together with all rights and obligations thereto pertaining by giving the other party at least sixty (60) days notice in writing of its intention so to terminate; provided, however, that the termination of any such license shall not relieve a licensee hereunder of its obligation

11320

to make any payment, as provided in Article VII hereof, of any compensation that may have accrued pursuant to this agreement prior to the effective date of such termination.

(b) DU PONT may at any time after August 19, 1949, terminate its obligations, under paragraph (b) of Article II and paragraph (a) of Article V of this agreement (to grant patent licenses and disclose technical information), by giving C.I.L. at least sixty (60) days notice in writing of its intention so to terminate.

ARTICLE IX

Objection or prohibition on the part of the United States Government shall be a valid plea on the part of DU PONT to decline to disclose information regarding any improvement, invention, discovery or commercial process that, but for such objection or prohibition, would come within the operation of this agreement.

ARTICLE X

(a) This agreement and the rights and licenses granted pursuant to this agreement shall inure to the benefit of and shall be binding upon the parties hereto and any subsidiary of C.I.L. that shall agree with C.I.L. in writing to be bound by the terms hereof; but otherwise, except as expressly provided in paragraph (a) of Article II and paragraph (b) of Article V hereof, the rights and licenses granted pursuant to this agreement shall neither be transferred nor assigned either in whole or in part to any third party.

M3320

(b) For the purposes of this agreement a subsidiary of C.I.L. shall be defined as any corporation or organization more than fifty per cent (50%) of the voting shares of which are owned or controlled directly or indirectly by C.I.L.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in duplicate by their representatives duly authorized and their respective corporate seals to be hereunto affixed as of the day and year first above written.

E.I. DU PONT DE NEMOURS AND COMPANY

By Kendell R. Swint
Director, Foreign Relations Department

ATTEST:

Assistant Secretary

CANADIAN INDUSTRIES LIMITED.

By [signature]
President

ATTEST

[signature]
Secretary

M3320

-7-

June 22, 1951

S C H E D U L E A

Schedule A consists of 41 pages listing 998 Canadian patents by inventor, patent number and date granted, and 224 Canadian patent applications by inventor, serial number, and filing date. It is omitted in the interest of brevity. Ten copies of the complete schedule were included in the documents submitted to the Government on June 15, 1950.

SCHEDULE B

PRODUCTS

Adhesives manufactured in whole or in part from pyroxylin

Alkali cleaners

Alkyd resins for finishes

Ammonia

Ammonium chloride, nitrate and persulphate

Anodes of brass, cadmium, copper, lead, nickel, tin or zinc

Artificial suede

Blasting caps, plain or electric, including delay action; and covered wire therefor

Blasting supplies and accessories

Boiler water compounds

Buckram

Calcium magnesium chloride

Caustic soda

Cellulose film, regenerated, transparent

Cellulose sponges

Chloride of lime

Chlorine

Chloroform

Coated and/or impregnated or laminated fabrics

Detonating fuses, commercial

Dinitrotoluol

Electroplating and polishing equipment and supplies

Ethylene glycol anti-freeze formulations

Explosives, commercial

M3320A

Schedule B (continued)

Ferric chloride

Fillers and absorbants for explosives

Fillers for wood and metal, including "Plastic Wood"

Fluxes, galvanizing, soldering or tinning

Fungicide formulations consisting in part (but not in whole) of "Fixed" copper compounds, copper sulphate, ferric dimethyldithiocarbamate, or zinc dimethyldithiocarbamate

Fusees and flares

Herbicide formulations consisting in part (but not in whole) of 2,4-dichlorophenoxyacetic acid or derivatives thereof

Hydrochloric acid

Hydrogen

Hydrogen chloride and peroxide

Insecticide formulations consisting in part (but not in whole) of benzene hexachloride, calcium arsenate, dichlorodiphenyl-trichloroethane (DDT), lead arsenate, pyrethrins (pyrethrum) or rotenone

Lead azide, sulphocyanate and styphnate

Leadtex elements

Livestock feed supplement formulations comprising inorganic compounds

Metal buffing compounds

Metal cleaners, emulsion type

Mixed fertilizer formulations

Moisturepreofing lacquers for coating films and papers

M3320A

Schedule B (continued)

Nitrated glycol, glycerine and sugar mixtures

Nitric acid

Nitrocotton

Nitroglycerine

Nitrodiglycerine

Nitroglycol

Non-stick liners

Nylon polymer, manufactured from caprolactam or diamines and dibasic acids or salts thereof

Nylon products, such as yarns, monofils, films, etc., manufactured from nylon polymer

Paint and varnish removers

Paints, enamels, lacquers, synthetic resin finishes, varnishes and stains, thinners and driers therefor and cleaners, polishes and waxes

Perchlorethylene

Phosphate rock, ground

Plastic articles manufactured from pyroxylin, cellulose acetate, or methyl methacrylate in sheets, rods, tubes or powder or from vinyl resin or styrene resin molding powders

Pyroxylin-coated and impregnated washable window shade cloth

Radiator compound formulations, automotive

Railway track signals

Rodenticide formulations consisting in part (but not in whole) of alpha-naphthylthiourea

Safety fuse powders

Safety fuses

Sheeting, composite, for collars, cuffs, toiletware, handbags, buttons, etc.

M3320A

Schedule B (continued)

Sheets and films manufactured from polyvinyl chloride

Signal bombs, fog signals

Sodium azide, bisulphate, bisulphite, chloride, hypochlorite, silicate, sulphate, sulphite and thiosulphate

Soil insecticide formulations comprising a coke and naphthalene hop spray mixture or lime and copper sulphate

Sporting powders

Styphnic acid

Sulphur

Sulphur dioxide

Sulphuric acid

Superphosphate and ammoniated superphosphate

Trichloroethylene

Urea - formaldehyde resins for finishes

Viscose

Zinc ammonium chloride and zinc chloride (including chromated zinc chloride)

M3320A

SCHEDULE C

Inventor	U. S. Patent No.	Granted
Shaw et al.	1,959,112	5/15/34
Shaw et al.	1,975,670	10/2/34
Shaw et al.	1,975,671	10/2/34
Duggan et al.	1,980,791	11/13/34
Shaw et al.	2,046,975	7/7/36
Harris et al.	2,089,957	8/17/37
Read et al.	2,098,835	11/9/37
McHaffie et al.	2,115,780	5/3/38
Moriarty	2,121,709	6/21/38
Tapley	2,131,574	9/27/38
Vincent et al.	2,149,373	3/7/39
Warrington	2,162,656	6/13/39
Shaw	2,166,224	7/18/39
Aitken et al.	2,203,764	6/11/40
Aitken	2,265,619	12/9/41
McHaffie et al.	2,415,142	2/4/47
Noakes et al.	2,436,596	2/24/48
MacDougall et al.	2,440,592	4/27/48

M3320A

SCHEDULE C (Continued)

Inventor	U. S. Application Serial No.	Filed
Aitken et al.	644,662	1/31/46
Robinson et al.	663,632	4/19/46
Deans	674,937	6/6/46
Allenby	683,972	7/16/46
Martin	731,053	2/26/47
Griggs	734,223	3/12/47
Allenby et al.	743,198	4/22/47
Allenby et al.	743,199	4/22/47
Allenby	747,129	5/9/47
Allenby	766,453	7/5/47
Segall	766,455	7/5/47
Cudmore	774,195	9/16/47
Janz	776,615	9/27/47
Hornibrook	9,970	2/20/48
Allenby	13,332	3/5/48
Allenby	13,333	3/5/48
Allenby	13,334	3/5/48
Segall	13,335	3/5/48
Allenby	13,336	3/5/48
Allenby	13,337	3/5/48
Allenby	13,517	3/6/48
Harris	24,098	4/29/48
Hornibrook	28,053	5/19/48
Hornibrook et al.	28,744	5/22/48
Kerr et al.	25,366	5/6/48
Kerr et al.	26,954	5/14/48
Kerr et al.	35,218	6/25/48

M3320A

Defendant's Exhibit No. 768

CC: R. P. SMITH

September 7th, 1948.

TO: W. J. BRETE
L. B. STEELE
W. G. HUNTER - D. F. DREW
F. C. LAKE - E. A. WIGHT

FROM: C. F. BROWN

Based on a new agreement with C.I.L. they are entitled to all technical and sales information they desire, but it is to be only on request and such requests must be channeled through Foreign Relations (B De Right). We, on our part, are not entitled to similar information from C.I.L.

Please be guided accordingly.

M-510

CFB:CP

FILE COPY

Defendant's Exhibit No. 769

~~Copy to: Mr. W. S. Carpenter, Jr.~~

November 4, 1949.

MR. A. B. ECHOLS, V. P.

OLIN INDUSTRIES LIMITED - CELLOPHANE LICENSE

The C.I.L./du Pont Agreement of August 19, 1948 cancels the I.C.I./du Pont/C.I.L. Tri-party Agreement. Du Pont grants C.I.L. a license under existing Canadian patents which are exclusive except for the right of du Pont to make, use and sell for use under the licensed patents and the right of du Pont's licensees under any corresponding United States patents and of customers of du Pont and of such licensees to sell and to sell for use under such Canadian patents.

We therefore have no commitment with C.I.L. which would prevent us from licensing a United States manufacturer to manufacture in the United States and sell in Canada.

FILE COPY

FOREIGN RELATIONS DEPARTMENT

J. K. JENNEY, ASST. DIRECTOR

JKJ.r

Defendant's Exhibit No. 770

~~[COPY OF ILLEGIBLE TEXTUAL MATERIAL]~~

Copy to Messrs. Lammot duPont
Irenee duPont
A. Felix duPont

May 25, 1926

Dr. Oskar Wolff,
Wolff & Company,
Walsrode,
Germany

Dear Sir:-

Acknowledging your letter of April 30th addressed to Mr. Irenee duPont; since receiving and examining samples of Perfect Powder we have come to the conclusion that it is in some respects not as good as duPont Oval, and certainly taking all propertiesiinto consideration, is in no way superior to what our Loading Companies can get by using duPont Oval and duPont Shotgun, each in its proper place. We are therefore not interested in acquiring the rights to manufacture Perfect Powder, nor in arranging for importations which we would distribute. We might be interested in negotiating to acquire the rights to the process with the idea that we might be able to develop something out of the process which would be valuable to us. Obviously this kind of an arrangement could not include obligations to import German powder.

As regards Transparit, we would prefer to refer the matter to Mr. Leonard Yerkes who is just returning from abroad and, therefore, will reply after obtaining his views, but of course we cannot agree to any understanding to support prices in this country as that is not lawful.

Very truly yours,

H. G. HASKELL

Vice President

M 3322

343342 O - 55 - vol 8 - 5

Defendant's Exhibit No. 771

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

VICE-PRESIDENT'S OFFICE

April 27, 1929.

Mr. L. A. Yerkes, President,
DuPont Rayon Company,
New York City.

L. A. Y.

263

Dear Len:-

TRADE EXPANSION POLICY
SOUTH AMERICA

Thanks for your welcome letter of April 25th.

In January of this year I discussed very briefly with Rene Bernheim the question of our selling Cellophane in South America and he expressed the feeling that from a competitive standpoint it would probably be difficult, and of course mentioned the limitation of our contract. He said, however, that this latter phase might be discussed, and I think, if at any time we see the way open to any real business, which we are apparently in the best position to handle, the matter will be subject to reasonable negotiations with Mr. Bernheim.

Very truly yours,

F. W. Pickard.

VICE PRESIDENT.

FWP:JMQ

CQ57-3
CG TOP-2

Defendant's Exhibit No. 772

Copy: Mr. F.W. Pickard
Wilmington.

May 6, 1929.

Mr. Albert Blum,
132 Madison Avenue,
New York, N.Y.

Dear Albert:

CELLOPHANE EXPORT SALES

I am enclosing copies of correspondence which I have had with Mr. Pickard regarding the above subject and about which I talked to you the other day at lunch.

In a preliminary way I would be glad if you would discuss this matter with Rene Bernheim, following the discussion which Pickard has already had and which he refers to in the enclosed copy of his letter dated April 27th.

My further suggestion would be, if you could get Bernheim to agree, to ask the Arena Trading Corporation (party to our original Cellophane agreement) to withdraw or hold up the restrictions now contained in our contract and allow us temporarily to sell Cellophane in South America in order to develop the possibilities of the market there and endeavor to determine whether we are in a better position to supply this market than they are in Europe, always with the understanding that they would be in a position to re-insert the restrictions at some later date.

If Bernheim is in a receptive frame of mind about this, I could discuss it with him in person some time later in the year, as I told you the other day I am inclined to think that some time during this year I probably had better go abroad.

You note what Mr. Pickard says about Wolff and Kalle. We would all be interested to know how this situation is going to work out, particularly with regard to their sales in the United States. You will remember of course that Kalle have no right to sell in the U.S., but Wolff have.

Yours very truly,

LAY-ML

CQ SUP 51

Defendant's Exhibit No. 774

EXTRACT FROM REPORT ON THE PROSPECTS FOR CELLOPHANE IN MEXICO

ST
11/1/30

REPORT ON THE

PROSPECTS FOR CELLOPHANE IN MEXICO.

	Page:
POLITICAL AND ECONOMIC BACKGROUND	1
CELLOPHANE PROBLEMS AND PROGRESS BY INDUSTRIES:	
Baked Goods	3
Candy	3
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Meat Products	4
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Tobacco Products -- Cigars	5
Narrow Fabrics	5
Food Products	5
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Summary	7
GENERAL COMMENTS:	
Size of Factories	7
Agents of Competitive Cellulose Sheeting	7
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SCHEDULE "A" (Estimate of Sales 1930 by Months)	12
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M 3303

FN. 6

AGENCIA COMERCIAL AMERICA: call their product Transparit, booklet has various thicknesses of P.T. and thirteen colors, as well as the embossed silk and linen. Orders taken in lots of one thousand sheets and upward, for shipment direct from factory in Frankfort, Germany. Price seldom the same to any two clients but usually somewhat lower than our published price list for Mexico. All sales made in U.S. dollars, c.i.f. Veracruz; delivery from two to three months.

J. M. MARROQUIN: carries a full line of confectioner's supplies including a substantial stock of the German material in P. T. and colors. Also 1/2" rolls of the various colors which is sold as a ribbon cord for utility and decorative purposes. This agent is widely known and secures a large number of small orders from the candy stores throughout the Republic. Unit of Sales usually one Hundred sheets, price very irregular sometimes higher for the P.T. than for the colors on the same invoice, but generally twenty centavos

M 350g Fn.6

per sheet and upward. Mr. Marroquin expresses dissatisfaction with the downward trend of prices and states that he may discontinue handling cellulose sheeting as there is no longer sufficient profit to pay for the trouble involved.

[illegible] COMPANY: orders taken in lots of one thousand sheets and upward for direct shipment from the factory. These people are more active competitors of Rayon than of CELLOPHANE.

ERNESTO EVERSTADT: Sells the German product along with Glassine and other types of paper. Shipments of all the materials made direct from the factories in Germany. Price varies with each customer but always in U.S. dollars, c.i.f Veracruz.

GUILLERMO FRIEDEBERG: carries a small stock of the German P.T. and colors along with other wrapping materials. Sales made chiefly in Mexico City in lots of one hundred sheets and upward. Price one centavo per sheet less than our printed price list, after six weeks to two months spent in correspondence getting adjustment on inventory, etc.

NATIONAL PAPER & TYPE CO: carry a small stock here and in several of their twenty-five branches throughout the Republic. Present stock of six thousand sheets P.T. and colors, representing a six months supply, was purchased by their New York office and sent direct from the factory in Germany. The manager states that there is no market for CELLOPHANE in Mexico.

BERNARD VOLNIE: whose advertisement in the classified directory states "Representatvie for paper factories producing paper, bond, china, onion skin, tablet, ledger, parafin, glassine, "Fenestra" Im. Celofan, and aluminum paper for Candy stores". This agent like National Paper and Type Co., is not a very active competitor.

These agents make no attempt to render any service, but seek the business entirely on a price basis. Their contacts are restricted to present users and a few of the larger concerns in an industry where one or more companies have already started using CELLOPHANE. Our very unusual action in supplying a printed price list from which no concessions are given, and the open, above-board manner of doing business with same treatment accorded all, has inspired confidence. In expressing appreciation for the service and merchandising suggestions, many of the larger accounts have repeatedly assured us of their future business regardless of a price differential. The carrying of a complete stock in Mexico City from which prompt deliveries can be made has been a substantial help in securing new accounts. By May first, 1931, we should at least have 75% and probably 90% of all the business here.

One customer, Larin, had on hand a quantity of German M.T. CELLOPHANE together with the special German adhesive for same. It was of the customary lighter weight stock produced by the Germans, and to the Simple tests applied, appeared entirely moistureproof. He claimed the price of this material was much less than our price for M.T. CELLOPHANE, but for some reason he continues ordering his requirements of this material from us. In all other cases, the presentation of Moistureproof has been a subject entirely new and frequently of considerable interest to the client.

From the beginning, most of the users of transparent sheets described their stock on hand as German "Celofan" and recognized that the product by DuPont was of superior quality. To the general public it was and still is merely a "papel transparente".

M 3303

Defendant's Exhibit No. 777

June 16, 1932

Mr. F. Meyer, Director
La Cellophane, S. A.
Bezons, France

Dear Mr. Meyer:

Answering your letter of June 8, the issuance of figures concerning foreign sales is a matter of policy which the Executive must pass upon.

Our understanding is that there have been recent communications between your officials and ours regarding exports in general and we respectfully refer you to the official correspondence for further details.

Very truly yours

DU PONT CELLOPHANE COMPANY, INC

S. M. Andrews
Export Manager

GMA:YL

FILED

M 3258

FN. 15

Defendant's Exhibit No. 778

EXTRACT FROM FOREIGN POSITION 1ST SIX MONTHS 1931 VS. 1ST SIX MONTHS 1932. FROM G. H. ANDREWS TO J. E. HATT

July 29, 1932

July 29, 1932.

TO: MR. J.E. HATT, G.M.
NEW YORK OFFICE

FROM: G.H. ANDREWS, E.M.

The Brazilian market, especially in Rio de Janeiro and Sao Paulo, has practically been dominated by Roberto Flogny & Cia., agents for La Cellophane, S.I.D.A.C., and I believe The Transparent Paper Co. of London. Flogny resents our entrance into the market and is openly antagonistic. Regardless of this, there are certain accounts which have had unsatisfactory dealings with Flogny and our own local connections have suitable standing in the trade. We should be able, therefore, to meet Flogny on at least an even basis with R.T. and eliminate him from N.T. practically entirely.

Defendant's Exhibit No. 779

DU PONT RAYON COMPANY OF MÉXICO, S.A.

EDIFICIO "CIDOSA"
AVENIDA URUGUAY 58
MEXICO, D. F.

September 1st, 1932.

Mr. C.H. Andrews, Export Manager
Du Pont Cellophane Company
350 Fifth Avenue
New York, N.Y.

The following analysis covers the present competitive price situation with Transparit.

Prices shown are in U. S. Dollars, Cif Veracruz

	P.T.	M.T.	Colors	P.T. Rolls	M.T.Rolls
Du Pont	.0387	.0557	.0477	.9758	1.4598
Transparit	.03	.046	.035	.77	1.40

On sheets prices quoted apply to square meters; on rolls, kilo basis.

We are quite certain that our German friends are selling quite some sheeting due to price differential.

The above data was secured from invoices of Agencia Anahuac, Transpa. t's local agent.

RJB/

M 3001

FN-13

Defendant's Exhibit No. 781

Dirección
ESTRAMPES 90

RAFAEL ORIOL

HABANA
CUBA

Cable
"MORIOL"

CARTA DEL REPRESENTANTE A	Du Pont Cellophane Co.		N.York
ASUNTO	Competition	FECHA	July 11/933

Dear Mr. Andrews:

In reply to yours of the 6th.

My explanation in regard to Germans underselling us ½ cent per sheet, meant that our price was half cent per sheet higher than the price offered and sold by Germans. In other words. the difference of price per case was more than $30.

In regard to Sylvania, you already have more information since my recent letter in which I sent information from Soko & Co.

And Japan, according to my recent information, is that they have raised their prices recently. I have not been able to verify yet their recent quotations. and will investigate this matter.

Both Costas and Socano have a regular stock on hand, and this is due to the regular imports made recently from other sources by the people we expected to sell.

Very truly yours,

Rafael Oriol

M 3278

Defendant's Exhibit No. 782

DU PONT RAYON COMPANY
INCORPORATED
NEW YORK, N. Y.

March 26, 1934.

Mr. L. A. Yerkes,
President,
NEW YORK OFFICE.

I do not see how we can subscribe to Brandenberger's letter of March 10th.

Our position was made clear in your letter of June 2, 1932, which was written as a result of the conclusion that DuPont was more or less the "goat" on some of the higher politics of Europe.

Just what the various European arrangements were in regard to plain transparent we could never understand. That is why Bernheim was told on June 2, 1932 that we would follow our own course.

"Equal rights" on moistureproof could mean nothing but equality of opportunity. We pioneered the moistureproof but have made no money. Take Japan as an example - Sales there were all moistureproof, upon which, during 1933, we lost $3,685.82. Why should we, after sending representatives to South America and Japan and incurring a large expense in so doing, simply hand over to La Cellophane 35,000 pounds of business? What have they done to entitle them to it?

BMM:HL

VICE-PRESIDENT.

CQ 55-3

Defendant's Exhibit No. 785

March 22, 1938

TO: O. F. BENZ, D.S.

FROM: O. E. ANDREWS, E.E.

SUBJECT: COLOMBIA

COPY

The attached copy of a letter from our agents in Medellin regarding European competition is more or less in line with the state of affairs in many of the other countries.

If Halaby can't get the business under su conditions, I question that any of our other agents will. He is a very capable individual and can get the business if there isn't too great a differential in favor of competition.

FILE

OEA:C
Enclosure

FN. 35 M 3286

Defendant's Exhibit No. 787

DUPERIAL

INDUSTRIAS CHIMICAS BRASILEIRAS "DUPERIAL", S. A.
CAIXA POSTAL 710
RIO DE JANEIRO
ENDEREÇO TELEGRAPHICO "DUPERIAL"

Original Via Airmail.
June 8th, 1939.
Letter nº 88-C/40.

To: CELLOPHANE DIVISION, NEW YORK CITY.

From: COMMERCIAL DEPARTMENT, "CLAR-APEL" DIVISION.

Subject: Monthly Sales Letter
April, 1939.

Stock sales of "CLAR-APEL" during April 1939, as compared to the foregoing month and April 1938, were the following:-

	APRIL 1939		APRIL 1938	MARCH 1939	
	Kilos	Rs.	Rs.	Kilos	Rs.
Moisturepr.	4.123	104:808$300	38:776$600	5.745	180:534$800
Reg.Transp.	18.910	379:670$400	74:644$900	4.581	87:599$000
Peg.Colours	341	10:751$100	5:083$100	76	4:177$600
	23.374	495:229$800	118:506$600	10.402	212:311$600

With reference to the sales of Moistureproof "CLAR-APEL", it is to be noted that there has been no shipment for Cia. Souza Cruz last month.

ACCUMULATIVE SALES from January to April were:

1939	1938
1.121:881$300	804:168$900

On April 15th, prices for "CLAR-APEL" have been advanced by 10%, due to the drop in exchange. Considering, however, that the orders on hand closed through the Conversion Section up to said date were based on the old prices, we have agreed to let them have a sufficient supply to cover said orders. Thus, while the sales for this month are showing unusually high figures, the next two months we will probably have to register a certain decrease.

Sales of "CLAR-APEL" standard size sheets could be increased considerably if we were in a position to meet, if and when necessary, the prices quoted by competitors. Of course, we think only of the German and Swedish agents, since the differences between our prices and those for Japanese paper are so large that it is almost out of question to meet them. São Paulo is the best market for the Japanese paper, where it is mainly sold to Converters and Laboratties, at ridiculously low prices.

Fn. 1 M 3280 (over)

FORM. 911

CONVERSION SECTION: Sales from this Section were as follows --

	April 1939	April 1938	March 1939
Converted	75:933$000	19:445$000	75:658$200
Non-Converted	48:761$300	54:092$200	60:599$100
	123:994$300	73:537$200	136:257$300

Although the figures of sales for the month of April were somewhat below average, orders on hand and the business we have pending in the different markets and mainly in Rio de Janeiro give us full confidence to report a substantial increase in our future sales.

Massas Alimenticias Aymoré Ltda. - (The Rio de Janeiro Flour Mills and Granaries Ltd.) - adopted, some months ago, a three colour bag for macaroni with so excellent results that the quantity of bags they consumed during the last four months exceeded by far their consumption for the whole preceding year. They have already decided to adopt new three-colour bags for two more types of macaroni and are ready to place an order envolving about 22.000 sq. m. of regular film.

From another important client in Pernambuco, dealing in macaroni, we secured a large order covering 15 to 20.000 sq. m. of regular "CLAR-APEL".

In Pará we also closed a fairly good business with a macaroni manufacturer.

We further secured a trial order from the largest macaroni manufacturer in São Paulo and are trying now to have them adopt printed "CLAR-APEL" wraps for their products in general. Chances are the best we can wish.

J. A. Stapelfeldt

J. A. STAPELFELDT.

M 3280

c.c. I.C.I.(American Dept.)London (sea)
I.C.I. New York "
F.R.D. Wilmington "
Mr. R. Olsburgh, Rio
Mr. Sterling Thompson, B.A.
"Duperial" São Paulo
2nd. mail.

jas:rk.

FN. 7

Defendant's Exhibit No. 788

June 22, 1939

AIR MAIL

TO: J. A. STAPLEFELDT
DUPERIAL
RIO DE JANEIRO, BRAZIL

FROM: T. W. HOLLAND

FILE COPY

SUBJECT: YOUR MONTHLY SALES LETTER APRIL 1939

It is very gratifying to note that your sales for April registered so substantial an increase over March and over April a year ago. This increase in sales is also nicely reflected in your cumulative sales and we hope that you will be able to hold this advantage throughout the rest of the calender year.

We note that your sales of moistureproof film were about the same over a period of months. We quite realize that this figure can be affected to a large extent by your sales to the Cia. Souza Cruz and that one order from them would have increased this figure considerably for April. However, in view of the fact that you are placed in such an unfavorable price position in regard to regular "Clar-Apel", we suggest that you put forth a special effort on the moistureproof film which you have a better chance of selling in competition to the European houses. We will discuss this situation with Sterling Thompson when he arrives next week and see if there is any direction that he can give us in regard to this matter of increasing our moistureproof sales.

Duperial in Uruguay experienced considerable difficulty in selling Swedich film even at competitive prices with other European material. The quality was decidedly off and they have decided not to purchase anymore of this type of film even though the price is very attractive.

Your price on moistureproof film is not higher than the British material but according to the test reports on this film analyzed here in competition to our own material, there

Continued on #2

M 3279

FN 7

is no question as to the superiority of our film over their's.

Frankly, we are not very optimistic up here about securing much lower prices on plain transparent film. In fact the Management would prefer to see an increase rather than a decrease in our standard prices. So that my recommendation is that you make every effort to increase your sales of moistureproof film and to continue to sell our plain film on the basis of its quality and performance. Furthermore, our experience has always been that were we to meet the prices now offered by Europe, it would only be a very short time before even lower prices would be submitted by these same companies. There seems to be no limit to what they will quote to get business.

We will discuss all of this at length with Mr. Thompson and will let you know fully on this subject later.

M3279

TWH:H

FN 1

Defendant's Exhibit No. 791

1677

5479

DU PONT EXPORTS OF CELLOPHANE -
1940-1950 INCLUSIVE, TO CERTAIN COUNTRIES

POUNDS

Country	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Angola	-	1,951	-	-	-	-	-	110	3,899	-	-
Australia	-	-	70,028	432,228	142,106	71,238	-	-	-	-	-
Austria	-	-	-	-	-	-	-	-	-	20,098	-
Azores	-	-	1,169	-	-	-	-	-	-	-	-
Belgian Congo	-	1,652	-	-	-	-	-	-	-	-	498
Belgium	-	-	-	-	-	-	-	-	4,714	752	12,119
Canary Islands	4,075	3,007	-	-	-	-	-	-	-	-	-
Celebes	-	-	-	-	-	-	-	-	-	966	-
China	-	5,666	4,462	-	-	-	-	-	44,047	-	(1,887)
Denmark	-	-	-	-	-	-	-	-	-	-	5,395
Egypt	41,774	33,453	-	-	-	-	-	-	-	-	-
England	-	-	-	-	-	-	-	-	-	11,226	-
Ethiopia	-	-	-	-	-	-	-	-	-	7,119	7,134
Finland	-	-	-	-	-	-	-	-	1,086	-	-
France	-	-	-	-	-	-	-	-	-	259	-
Germany	-	-	-	-	-	-	-	-	-	1,729	-
Greece	-	-	-	-	-	-	-	-	465	368	-
Iceland	872	-	3,439	899	592	-	-	-	6,466	-	-
India	-	-	119	614,909	-	542,306	-	-	-	-	8,554
Iran	-	-	-	-	-	-	-	-	-	5,787	1,243
Iraq	-	-	193,244	143,535	66,797	48,896	-	-	22,365	-	278
Italy	-	-	-	-	-	-	-	-	-	83,835	-
Japan	3,031	284	-	-	-	-	-	-	-	-	2,664
Java	60,237	107,086	21,920	-	-	-	-	-	-	9,149	2,868
Liberia	46	95	-	-	-	-	76	-	-	-	-
Luxemburg	-	-	-	-	-	-	-	-	-	4,372	21,887
Morocco (Fr.)	-	373	-	-	2,032	2,443	-	-	-	-	-
Netherlands	-	-	-	-	-	-	-	-	432	-	-
New Zealand	-	-	45,158	-	4,492	1,943	-	-	-	-	-
Palestine	-	711	-	-	-	-	-	-	1,074	-	-
Philippine Is.	123,466	173,864	-	-	-	27,202	129,094	166,012	159,900	210,311	492,745
Portugal	1,295	29,473	26,721	16,859	1,497	-	-	-	10,588	-	-
Port.E.Africa	-	1,126	-	-	881	-	-	-	3,922	3,186	-
Siam	-	-	-	-	-	-	-	-	-	-	9,949
Spain	-	-	-	-	-	-	-	70	-	-	-
Sumatra	-	-	-	-	-	-	-	-	-	958	-
Sweden	-	-	-	-	-	-	-	-	-	-	23,547
Switzerland	-	10,877	104,874	-	-	-	-	3,391	8,545	88,667	122,175
Tangiers	-	-	-	-	-	-	-	-	2,184	139	-
Union of So.Africa	2,444	35,438	-	-	-	-	-	-	93,952	165,242	79,484

Source: 1940-1949 Inclusive -- Government Exhibit No. 399
1950 Invoices

EXPORT DISTRIBUTORS FOR DU PONT CELLOPHANE
AS OF DECEMBER 31, 1945, DECEMBER 31, 1947 AND
DECEMBER 31, 1950

Country	Distributors		
	As Of December 31, 1945	As Of December 31, 1947	As Of December 31, 1950
Angola	Agaesse, Ltd. Loanda, Angola, Port. W. Africa		
Argentina	"Ducilo" S.A. Productora de Rayon Buenos Aires, Argentina	"Ducilo" S.A. Productora de Rayon Buenos Aires, Argentina	"Ducilo" S.A. Productora de Rayon Buenos Aires, Argentina
Australia	Lambert Products Pty. Ltd. Melbourne, Australia		
Belgium			N. V. Spruyt & Co. Antwerp, Belgium
Bermuda	Butterfield & Company Ltd. Hamilton, Bermuda	Butterfield & Company Ltd. Hamilton, Bermuda	Butterfield & Company Ltd. Hamilton, Bermuda
Bolivia	Mac Donald & Company La Paz, Bolivia	Mac Donald & Company La Paz, Bolivia	Mac Donald & Company La Paz, Bolivia
Brazil		Industrias Quimicas Brasileiras "Duperial" Sao Paulo, Brazil	Industrias Quimicas Brasileiras "Duperial" Sao Paulo, Brazil
Chile	Perez, Reitze y Benitez, Limitada Santiago, Chile	Perez, Reitze y Benitez S.A.C. Santiago, Chile	Perez, Reitze y Benitez S.A.C. Santiago, Chile
China			Du Pont (China) Inc. Hong Kong
Colombia	Luis H. Delgado Cartegena, Colombia	Luis H. Delgado Cartegena, Colombia	Luis H. Delgado Cartegena, Colombia
	C. E. Halaby & Co. Ltd. Bogota, Colombia	C. E. Halaby & Co. Ltd. Bogota, Colombia	C. E. Halaby & Co. Ltd. Bogota, Colombia
	C. E. Halaby & Co. Ltd. Medellin, Colombia	C. E. Halaby & Co. Ltd. Medellin, Colombia	E. Uribe M. Medellin, Colombia
	Martinez & Rego. Cali, Colombia	Martinez Docampo & Cia. Ltda. Cali, Colombia	Martinez Docampo & Cia. Ltda. Cali, Colombia
	Jose Puyana U. Bucaramanga, Colombia	Jose Puyana U. Bucaramanga, Colombia	Jose Puyana U. Bucaramanga, Colombia
	Jose Spinner Barranquilla, Colombia	Jose Spinner Barranquilla, Colombia	Jose Spinner Barranquilla, Colombia
Costa Rica	John M. Keith & Co. S.A. San Jose, Costa Rica	John M. Keith & Co. S.A. San Jose, Costa Rica	John M. Keith & Co. S.A. San Jose, Costa Rica
Cuba	Rafael Oriol Havana, Cuba	Rafael Oriol Havana, Cuba	Rafael Oriol Havana, Cuba
	Sucesores de Pablo M. Costas Havana, Cuba		
Dominican Republic	Baquero Hermanos C por A Ciudad Trujillo, Dominican Republic		
	John Dominguez & Company Ciudad Trujillo, Dominican Republic	John Dominguez & Company Ciudad Trujillo, Dominican Republic	John Dominguez & Company Ciudad Trujillo, Dominican Republic
Ecuador	Compania de Industrias y Comercio S.A. Guayaquil, Ecuador	Compania de Industrias y Comercio S.A. Guayaquil, Ecuador	Compania de Industrias y Comercio S.A. Guayaquil, Ecuador
Egypt	Joseph & Maurice Levy & Co. Alexandria, Egypt		
	Vittorio Picciotto & Co. Cairo, Egypt		Transport & Engineering Co. S.A.E. Cairo, Egypt

No. 792

1978

5480

Country	ber 31, 1950
Guatemala	C Suc. uatemala
Haiti	e, Haiti
Honduras	L onduras
Iraq	He
Java	N. Crediet-en Handels Vedam" therlands East Indies
Luxemburg	
Mexico	Du co
Netherlands	o
Northern Rhodesia	td. th Africa
Nicaragua	Ma Co., Ltd. a
Palestine	, Inc.
Panama	Mc ma
Peru	Du
Philippine Republic Philippine Islands	J. es
Portugal	Be
Portuguese East Africa	td. th Africa
Salvador	Ch Salvador
Southern Rhodesia	td. th Africa
Switzerland	La pack Switzerland
Union of South Africa	G. td. th Africa
Uruguay	Ins Brasileiras "Duperial" ay
Venezuela	Ca ucs. a
	M. uela

Source: Agreements file
E. I. du Pont

+ Listing folio 5481

R-12041

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

"CELLOPHANE" DIVISION

October 18, 1940

TO: G. H. ANDREWS

FROM: C. F. BROWN

Subject: PROSPECT LIST

Please send me just as promptly as possible the list you have been working on of prospects in territory which hitherto has been closed to us.

You might indicate after each name its source, i.e., whether you have picked it up as a du Pont agent of some other department without direct inquiry, and those who have made inquiry from us before and have been turned down.

Our policy will be determined more or less individually rather than making a blanket ruling, so it is quite necessary that I get this list as quickly as possible.

CFB MdM

M 3163

FN. 2

"Cellophane" is a trade mark and should be spelled with a capital "C"

Defendant's Exhibit No. 797

E. I. DU PONT DE NEMOURS & COMPANY
WILMINGTON, DELAWARE

"CELLOPHANE" DIVISION
MANUFACTURERS OF CELLULOSE FILM

CC: G.H. ANDREWS - N.Y.

November 1, 1940.

MR. C.F. BROWN, D.S.
"CELLOPHANE" DIVISION.

EXPORT ACTIVITIES

I have gone over this list of possible sources of new business for our material, submitted by Mr. Andrews, and I don't believe at all that we should just commence a general broadcast solicitation of business.

In most cases it will be a waste of money because in many of these countries described there are conditions that would prevent any satisfactory operation, and secondly in the case of countries in the British Empire I think to a very great degree they are getting what they require out of England, where I understand the shipment of all regular export trade is carried on to the greatest extent possible under these trying conditions. We would be operating at a substantial disadvantage here too because of the difference in rates of exchange, and so I think about all that could be used in this list at the moment would be the following countries.

In Iceland I would think there was no objection to continuing negotiations with these three people whom we have been in touch with, to try to select the best agent possible or perhaps at this time to sell even all three of them if they want to but I don't know that we are in a position to judge in the case of selectivity, and therefore negotiations might be carried on with all of them to the extent that what information we have regarding their position and their credit is satisfactory.

The same thing goes for Portugal and perhaps for Portuguese East Indies and Portuguese West Africa. In the case of one concern at least who happens to be the F. & F. agents in Lisbon, they seem to operate in all these territories.

There is also a request here thru the General Motors Overseas Corporation in New York which might be worth following up and determine to what extent they are interested.

Cellophane M 3152 Fn. 4

At the moment and under present conditions I think there is no point in spending any time or effort on Finland, Greece, Spain, Sweden, Turkey, where war conditions would seem to prevent any possibility of a satisfactory operation at the moment.

The present position of the Executive Committee is that we should not attempt any increased activity either in Germany, Italy or Japan, but this is not to be discussed outside because it may be misunderstood and should be regarded as a confidential matter.

This may mean that at least in the Japanese sphere of influence China would be affected just as the European countries occupied at present by Germany would likewise be involved, so that I don't know that there is any point in thinking seriously about China at the moment unless it should be that the Organic Chemicals Department have a direct connection there that might be interested.

In countries like Iran and Manchukuo where we have no inquiries nor no connections at present, I don't think there is any point in attempting an effort at the moment.

Regarding Australia, New Zealand, Union of South Africa, Egypt and other principal British Dominions, I believe we would best confine our activities, if any at all, to answering inquiries that we may get. I definitely think we are not interested at all in opening a new effort in British territory in which we have no contact nor inquiries.

The Netherlands East Indies might be an opportunity to a certain ~~extent at least, particularly~~ if you were following up thru one of the agents of some one of our Company's other Divisions.

In Iraq to such extent as you may have had inquiries, these might be answered and followed, but in the case of Switzerland I understand from Washington Service today that both their imports and exports are strictly controlled by the Germans, so that I think you will find practically no possibility of anything there at the moment.

I would not engage in any distribution of a general questionnaire but would confine what seemed to be possibilities of business here to correspondence definitely directed to such people as we may think we want.

This very materially cuts down the effort indicated in this long list of names but it seems to be the much more desirable and certainly much more conservative method to follow.

Fw. 4 M3152

If and as new inquiries are received from legitimate concerns in other countries, consideration might be given to handling them on the same line, namely replying, offering them our material in the regular fashion.

I don't believe that we have reached the point where we would be justified in soliciting established agencies on a selected basis. I think you should reserve the right to sell anybody at least until you know more about who the desirable distributors are.

I return herewith the Andrews' letter in question.

J.E. HATT
DIVISION MANAGER

JEH:LMB
Att.

M3152

FN. 4

Defendant's Exhibit No. 798

CC: J. F. HATT
R. F. T. HAFF

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

"CELLOPHANE" DIVISION

November 5, 1940

TO: D. F. ANDREWS
NEW YORK

FROM: C. F. BROWN

Subject: EXPORT POLICY

The following will serve to summarize and amplify somewhat Mr. Hatt's letter of November 1 regarding the expansion of export activities:

1. Sponges.
   Orders should be accepted and agencies established wherever transportation and exchange facilities permit.

2. Caps and Bands.
   Policy should be followed as outlined for films.

3. Films.

   a. Orders.
   Quotations can be made on inquiries and orders accepted for any country where deliveries and payments can be properly handled.

   b. Agencies.
   A limited list of countries should be selected where present conditions justify attempt to establish connections.

   These include the following:

   Ireland, Portugal (including possessions) Netherland East Indies, Iraq.

   Consideration should be given to two plans:

   Find out from local sources the best prospect and offer exclusive agency, or

   During these unsettled conditions, solicit and sell all good prospects.

   If you desire to develop information regarding any prospective agent, use an individual letter rather than a formal questionnaire.

   c. Policy regarding British Empire and protectorate nations.

   Diligently follow all inquiries and accept all orders but do not solicit agencies.

"Cellophane" is a trade mark and should be spelled with a capital "C"

M 3151 FN. 5

R-12041

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

"CELLOPHANE" DIVISION

G. H. Andrews, 2. 11/5/40
concluded

If you have any questions to raise or suggestions to make regarding the above or Mr. Hatt's letter, please do so promptly.

CFB MdM

M3151

11/12/40
Comm with
Mr. MN. RA-Ch.
To go on [illegible]
in file + follow up.

"Cellophane" is a trade mark and should be spelled with a capital "C"

FN. 5

Defendant's Exhibit No. 799

CC: J. E. HATT

E. I. DU PONT DE NEMOURS & COMPANY
WILMINGTON, DELAWARE

"CELLOPHANE" DIVISION

December 18, 1940

TO: G. H. ANDREWS

FROM: C. F. BROWN

Subject: EXPORT POLICY

Referring to the points raised relative to the following up of inquiries, this seems to be covered adequately by my memorandum of November 5 which states "diligently follow all inquiries and accept all orders, but do not solicit agencies."

There is no reason why you should not actively promote in every possible way business which has been initiated by any inquiry from any part of the world, where deliveries and payments can be properly handled. This applies specifically to Egypt, South Africa, and any British possessions or protectorate nations as well as any other country.

As to past inquiries, it is perfectly proper to reopen their interest by a letter to the effect that we would welcome inquiries and we are willing to supply their requirements subject, of course, to present transportation facilities. There is no reason why such letters should not be as good sales and promotion letters as can be written, but I doubt the propriety or advisability of quoting definite prices so long after the original inquiries were sent. Naturally if interest is involved, an inquiry will result which can be handled in the usual way.

Naturally we are anxious to start promotion on all business received, particularly with respect to the Egyptian situation, and you should immediately start reviewing your 1939-40 files and write inquirers who have been turned down in the past. It would seem advisable that these letters be individually typed, rather than any circular letter.

The establishment of agencies is covered in my letter of November 5 and is limited to certain countries specifically mentioned therein.

We are hopeful that active promotion on your part of all business and opportunities will be undertaken with the greatest possible vigor in order to materially improve our export position in 1941.

CFB MdM

M 3150

FN. 6

"Cellophane" is a trade mark and should be spelled with a capital "C"

Defendant's Exhibit No. 800

AIR MAIL

November 18, 1940

Costas & Fernandes, Ltda.
Avenida dos Aliados 66-2°
Porto, Portugal

Gentlemen:

Through the courtesy of Mr. E. M. Knox of our Organic Chemicals Dept., we have been referred to you with the thought that you might wish to have us give consideration to your firm as a possible agency connection for us in Portugal.

This department manufactures and sells cellullose film for wrapping and other purposes and cellulose seals which are used as secondary closures on bottles, jars, etc. Samples of these products will reach you with the sea mail copy of this letter.

You are, no doubt, quite aware of our standing as the foremost cellulose film manufacturers of the world and more particularly as the inventors of the moistureproof cellulose film which is used as a wrapper on cigarettes, cigars, candies, etc. We manufacture the original or base film, too, and an acetate type of film which is waterproof.

Our cellulose seals are used in the States on liquors, wines, food stuffs, and are mainly of the band style rather than capsule such as you may be accustomed to and we feel reasonably sure you will find them of some importance in your country.

With the sea mail copy of this letter you will receive some literature and prices on these items for further study but meanwhile, in case you believe you would be interested in handling these items in Portugal, would you mind looking into the potential outlets, competitive conditions, etc., so that when the sea mail letter arrives no further delay will ensue.

When writing us, will you please tell us something of the operations of your organization, number of salesmen employed, whether you buy for your own account, whether you have branches, etc., etc. There is no need to tell us of your financial capacity as all sales for the present would have to be handled on a confirmed irrevocable letter of credit for the present.

It might be well to let you know that under a formal agency agreement the discount to you would be 10% from our list prices which are published for Portugal.

Very truly yours,

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

ES

M 3141 FN. 7

Defendant's Exhibit No. 801

DU PONT

AGENTES EXCLUSIVOS EM PORTUGAL

E. I. DU PONT DE NEMOURS & Co. Inc.
WILMINGTON-DELAWARE
(UNITED STATES OF AMERICA)

ANILINAS
PARA TODAS AS INDUSTRIAS

PRODUTOS INTERMEDIARIOS

NEOPRENE E PRODUTOS PARA FABRICO DE BORRACHA

PRODUTOS AUXILIARES
PARA A... INDUSTRIAS TEXTOIS, CORTUMES, ETC.

-Copy by sea mail-

TELE { PONE, 7103 / GRANAS ANILINA
CODIGOS { A. B. C. 5.a / BUEYES / RIBEIRO

COSTAS & FERNANDES, L.DA

SEDE – AVENIDA DOS ALIADOS, 66-2.º

PORTO, 12th December 1940.

E. I. Du Pont de Nemours & Co. Inc.
Empire State Building.
NEW YORK, N. Y.

Gentlemen:

We are in receipt of your letter of 18th November ult. which was suggested to you by the courtesy of Mr. E. M. Knox.

As you certainly know we are exclusive Agents of the Organic Chemicals Department., of the E. I. Du Pont de Nemours & Co. Inc. WILMINGTON-Delaware, for Portugal, and this manner, our commercial organization is perfect. Besides, will be improved with all circunstances that may be required.

We have Agents in Lisbon, and others in the principals parts of our country.

For the sale of your cellulose film we have easiness to get competent persons, and at present persons who are working with us have a good knowledge of this article.

We are already able to let you know that we have spoken with the most importants firms and which are large consumers of the cellulose film. We shall have very interest in receiving literature, samples, prices, by sea mail and which were announced by you. We are quite sure to obtain several orders if your quotations were in accordance with the competitive.

Among our partners we shall find very important commercial relations in order to improve the sales of your cellulose film.

Hoping to receive your already announced letter by sea mail, we remain,

Yours truly,

Costas & Fernandes

M 3140

Fn. 7

Defendant's Exhibit No. 802

December 31, 1940

VIA "CLIPPER"

Costas & Fernandes, Ltda.
Av. dos Alliados 65-2º
Porto, Portugal

Gentlemen:

This will acknowledge and thank you for your letter of December 12 advising of your interest in working with us in the sale of the products of this division. The literature, samples, etc., sent you with the sea mail copy of our letter of November 18 should be reaching you before long and we shall be glad to have your further advice as soon as this material is received and you have had an opportunity to do some work on it.

We have just been in touch with Pan American Airways with reference to sending some samples and literature by air express but there is no such service to Portugal at this time. In view of the delays which are occurring in trans-Atlantic mails, we presume our sea mail letter will eventually reach you, but for the purpose of insuring all possible facility, we are sending you another selection of samples, literature and prices with the sea mail copy of this letter.

We might mention you at this time that you are very apt to run into all sorts of prices on products such as we have to offer and, in a like manner, you will also run into all sorts of qualities. We have no hesitancy, therefore, in telling you at this time that our prices are not the lowest that may be had but that they are in accord with the quality of the material which we have to offer. If your house has been accustomed to selling products on a price basis, then there would be no value whatever in our working together. This is a perfectly frank statement on our part and we hope that you will be equally frank in writing us along similar lines if you are not willing to sell a quality product at a reasonable price.

In view of the necessity at this time of having to do business on a Conf. irrevocable Letter of Credit basis, we would like to suggest for the sake of expediency that on any Letters of Credit which may be issued in our favor you have them issued thru an American bank rather than a foreign bank, particularly those of belligerent or

M 3139 Fn. 1

belligerent controlled nations. Letters of Credit issued thru other than American banks are subject to considerable delay in handling at this end and it is for this reason that we prefer dealing with American banks.

There is one other feature about the handling of orders for cellulose film about which we wish to caution you, and that is that you should not offer it or accept orders for it under the designation "Cellophane". "Cellophane" is a registered trade mark and not the name of a product. We own the mark "Cellophane" in the United States and sell our product under this mark in this country but we do not own the mark in Portugal. You should therefore offer our product under a generic term such as cellulose film or its equivalent in Portuguese, French, etc. Be sure, however, not to offer or accept orders for it bearing the term "Cellophane" or cause to have the word "Cellophane" appear on Letters of Credit, etc.

FILED

Very truly yours

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

GHA:TL

M 3139

Defendant's Exhibit No. 803

January 21st, 1941

VIA TRANSPACIFIC AIR MAIL

Firma E. Dehers, Succr. de A. Laplace,
130 Kesawan,
Medan,
Sumatra

Dear Sirs:

Through the Foreign Commerce Weekly, a United States Department of Commerce publication, we have learned of your interest in receiving quotations on "thin transparent paper for the wrapping of candy, cakes, etc..."

We are quite sure that our transparent cellulose film, a material widely employed in this country and abroad as a wrapping material primarily, but also having characteristics which make it useful in other directions, would be well suited for the purpose stated in your inquiry. It is available in two basic types, the most important being the Moistureproof, which is used on cigarettes, cakes, candy, etc., and the other one, the non-moistureproof or original material, such as used to be normally available from Europe.

This is available in the plain white, or colorless, as well as in the several colors per sample enclosed. On the plain transparent we could supply you with a 30-gram material, but the colors are available only in the 33-gram weight. In the case of our Moistureproof film the weight is approximately 36 grams per sq. meter. This latter film is of the heat-sealing type and may be sealed in much the same manner as waxed paper is sealed.

In sheets of our standard sizes, i.e. 100 x 100 cm, or 90 x 100 cm approximately, the prices on the above materials would be as follows:

PLAIN TYPE OF FILM

#300 Transparent	US$0.025	per sq. meter
Colors "A" (Amber, Tango, Pink, Red, Light Blue, Orchid)	US$0.035	" " "
Colors "B" (Light Green, Dark Green, Dark Blue, Violet)	US$0.038	" " "

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FN. 18

M 3132

MOISTUREPROOF TYPE OF FILM

#300 Transparent	US$0.034 per square meter
Colors "A"	US$0.057 " " "
Colors "B"	US$0.065

Size 73 x 100 cm, such as your inquiry calls for, is in the category of cut sheets and, therefore, would have to take a higher price than our stock sizes, as above noted. It would be to your advantage, from a price standpoint, to take our regular sizes.

With regards to packing, we wish to point out that the standard packages would contain 500 sheets of a size, 10 packages to a case, or a total of 5,000 sheets. This is our standard method of packing, which has been used in export to all parts of the world without any complaints.

The foregoing quotations are F.O.B. our factory, at either Richmond, Va., or Buffalo, N.Y., with freight allowed and prepaid to the port of New York. Shipping time from factory to New York is approximately 48 hours. Shipment of the transparent, or colorless, items could be made from the factory within approximately ten (10) days to two (2) weeks after receipt of order at this office. In the case of Moistureproof colors, shipment might be subject to a slight delay, depending on color selection.

Due to unsettled exchange conditions now prevailing abroad it is necessary for us to quote on the basis of payment against irrevocable letter of credit on an established New York bank, in U.S. Dollars, against presentation of Railroad Bill of Lading or warehouse receipt.

As per your request, we are attaching samples of the material on which we have quoted, and trusting that these will prove of interest to you, we remain

Very truly yours,
E.I. DU PONT DE NEMOURS & CO., INC.,
"CLAR-APEL" DIVISION

CM C. MARCIAL - EXPORT SALES

M3137

Defendant's Exhibit No. 804

February 21, 1941

Mr. Juan Garcia Aragon
Santa Rosalía 51
Santa Cruz de Tenerife
Canary Islands

Dear Sir:

Quite some time ago you wrote us regarding cellulose film for the Canary Islands but at that time we were not prepared to be of direct assistance.

With conditions throughout the world being upset generally it is possible that you may still be interested in our product and it is with this thought in mind that we are writing you.

As you perhaps know, we are one of the largest, if not the largest, manufacturer of cellulose film in the world and the developers of moistureproof film, which has found a large sale in the wrapping of tobaccos, candy, biscuits, crackers, dried fruits and many other products.

We are also manufacturers of the original or non-moistureproof film such as you may have been accustomed to ordering from Europe. The quality of this product compares very favorably with that produced by the other manufacturers.

There are enclosed samples of our 300 PT and 300 PC films as well as samples of our 300 MST. A copy of our current price schedule is also enclosed. This schedule, as you can appreciate, is subject to change without notice.

We are in a position to effect prompt shipment from the factory to New York but delays are being encountered on sailings out of New York. Should you favor us with any business, will you please bear this in mind?

Due to conditions over which we have no control, the prices quoted are in U. S. Dollars with order or confirmed irrevocable Letterof Credit on an approved New York bank.

Very truly yours

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

GHA:TL
Enc.

M 3128

P.S. Kindly note that we do not own the trade mark "Cellophane" in the Canary Islands and that this word should not be used to describe our product in your country. In lieu thereof we suggest you use the generic term "cellulose film".

M3128.

Defendant's Exhibit No. 805

February 24, 1941

1 A AIR MAIL

Mr. C. P. Callister
Kraft Walker Cheese Co.
P. O. Box 1621 M
Melbourne, Australia

Dear Mr. Callister:

Some time ago you addressed us with reference to a special type of moistureproofed cellulose film with a view to using it in your packing operations. At that time we were not shipping our product to Australia.

With conditions changing thruoughout the world, it occurs to us that you may still be interested in this product, and we are taking the liberty of sending you herewith samples of this product, which is sold under the term 300 MSAT.

This product was developed especially for use in connection with the wrapping of quick frozen products such as fish, fruits, etc., having high water contents.

The processing is well anchored to withstand exposure to highly humid conditions for extended periods and it is in addition moistureproof and extremely flexible.

We are enclosing samples of this film and are tabulating below the prices applying thereto. Further details will be given you glady.

Very truly yours

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

JUN

GHA:TL
Enc.

#300 MSAT

Minimum Quantity		
5,000 Sheets	Stock Size Approx. 40" x 40"	$.03 Per M Sq. Mtr
7,000,000 Sq. Inches	Cut to Size Sheets	.034 " " " "
500 Pounds	Rolls 1-1/2" to 40" Wide	.57 Per Pound

The foregoing prices are in U.S. Dollars at New York
Shipping terms are F.A.S. New York.

FN. 17 M 3133

Defendant's Exhibit No. 806

February 24, 1941

VIA "CLIPPER"

Heskia Danon Fils
B. Postal Ist. #151
Istanbul, Turkey

Gentlemen:

Due to conditions abroad which have disrupted normal trade relations, it is possible that you might be interested in a reliable source of supply for transparent cellulose wrapping material, and if this should be true, we shall be pleased to be of service.

You may know that we are large manufacturers of transparent cellulose film for wrapping and other purposes; that we manufacture not only the original non-moistureproof film but, in addition, a moisture vapor proof film of the highest quality.

This latter film is used extensively in the U.S.A. as a wrapper for cigars, cigarettes, tobacco, certain types of candies, biscuits, crackers, etc., in fact, wherever the maintenance of factory freshness in the manufacturer's product is a requisite to successful sales.

While we are best known as the originators of the moisture, vapor proof sheeting, our non-moistureproof or regular film is the equal to or better than that produced elsewhere, as you will see from the samples enclosed.

At this time our facilities for handling additional business are quite adequate and orders are being attended to without delay from the factory to the Port of New York. Due to lack of sailing accommodations at the port, some minor delays are occurring on shipments to some countries, but these are rarely serious.

Conditions existing thruout the world with respect to exchange transfers make it necessary that our offer be subject to payment in U.S. Dollars with order or with a confirmed irrevocable Letter of Credit on an approved New York bank.

We shall be pleased to be of further service to you in accordance with the enclosed price schedule and will gladly supplement this letter with any additional information you

M 3145 FN. 13

may desire.

Very truly yours

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

GHA:TL
Enc.

P.S. Kindly note that we do not own the trade mark "Cellophane" in your country and that this word should not be used to describe our product. In lieu thereof, we suggest that you use the generic term, "cellulose film".

M3145

FN. 13

Defendant's Exhibit No. 807

February 25, 1941

VIA "CLIPPER"

C. Alick Phillips
85 Harcourt Parade
Roseberry
Sidney N.S.W., Australia

Gentlemen:

Due to conditions abroad which have disrupted normal trade relations, it is possible that you might be interested in a reliable source of supply for transparent cellulose wrapping material and if this should be true, we shall be pleased to be of service.

You may know that we are large manufacturers of transparent cellulose film for wrapping and other purposes; that we manufacture not only the original non-moistureproof film but, in addition, a moisture vapor proof film of the highest quality.

This latter film is used extensively in the U.S.A. as a wrapper for cigars, cigarettes, tobacco, certain types of candies, biscuits, crackers, etc., in fact, wherever the maintenance of factory freshness in the manufacturer's product is a requisite to successful sales.

While we are best known as the originators of the moisture vapor proof sheeting, our non-moistureproof or regular film is the equal to or better than that produced elsewhere, as you will see from the samples enclosed.

At this time our facilities for handling additional business are quite adequate and orders are being attended to without delay from the factory to the Port of New York. Due to lack of sailing accommodations at the port, some minor delays are occurring on shipments to some countries, but these are rarely serious.

Conditions existing thruout the world with respect to exchange transfers make it necessary that our offer be subject to payment in U. S. Dollars with order or with a confirmed irrevocable Letter of Credit on an approved New York bank.

We shall be pleased to be of further service to you in accordance with the enclosed price schedule and will gladly supplement this letter with any additional information you may

JUN 1942
G. H. ... LEWIS

M 3134

desire.

Very truly yours

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

GHA:TL
Enc.

P.S. Kindly note that we do not own the trade mark "Cellophane" in your country and that this word should not be used to describe our product. In lieu thereof, we suggest that you use the generic term, "cellulose film".

M3134

Defendant's Exhibit No. 808

March 6, 1941

VIA "CLIPPER"

E.C.E. Etablissements due Commerce
et d'entreprise
Boite Postale 33
Teheran, Iran

Gentlemen:

Your letter of December 31, 1940 has reached us thru our main office at Wilmington. None of the items on your list are manufabtured by us but we are, as you may know, America's foremost manufacturers of cellulose film for wrapping purposes.

Inasmuch as you list two items of glassine in Position #14 and #15 we are taking the liberty of quoting you on our cellulose film in place thereof.

We manufacture two types of film, one being moistureproof and the other hon-moistureproof. The moistureproof film is of approximately 36 gram weight; the non-moistureproof of approximately 33 gram weight.

The moistureproof film was developed by du Pont chemists to fulfill a long wanted need in wrapping materials of a transparent nature. It found almost immediate use in the tobacco industry. Today all of the important American cigarette manufacturers use it as well as many manufacturers abroad.

This film is usually supplied in the heat sealing variety which is designated 300 MST-52. It seals in about the same manner as waxed glassine. The various standard wrapping machines such as Rose, Molins, etc., handle it very well. It may also be handled manually with ease and sealed on an ordinary electric hot plate of the type manufactured by Gruenberg, as per leaflet attached. Recently the important American cigarette manufacturers commenced using opening tape on their packages. A reprint illustrating this is enclosed.

The non-moistureproof film was originally produced in France and you are, no doubt, entirely familiar with it. However, we might tell you that this product of our manufacture is equal in quality to that produced anywhere else in the world.

FN. 19

M 3131

It is exceptionally uniform in quality and performs with a minimum of trouble on all standard wrapping machines. For a non-moistureproof film we commend it to your consideration.

Samples of the moistureproof and non-moistureproof films are enclosed and attached we are quoting you specifically on the items shown under Position 3 #14 and #15. We are also enclosing a copy of our general price schedule. A commission of 5% will be allowed you, the commission to be paid as we receive payment. We are in a position to effect prompt shipment upon receipt of confirmed irrevocable Letter of Credit on an approved New York bank. Sailings from New York for Teheran are, as you may know, irregular and this should be taken into consideration when Letters of Credit are issued.

Very truly yours

G. H. ANDREWS, Mananger
CELLULOSE FILM EXPORT SALES

GHA:TL

P.S. Kindly note that we do not own the trade mark "Cellophane" in your country and that this word should not be used to describe our product. In lieu thereof, we suggest you use the generic term, "cellulose film".

M 3131

Defendant's Exhibit No. 809

FAST DIRECT

RCA

RADIOGRAM

R.C.A. COMMUNICATIONS, INC.

A RADIO CORPORATION OF AMERICA SERVICE

TO ALL THE WORLD — BETWEEN IMPORTANT U S CITIES — TO SHIPS AT SEA

RECEIVED AT 64 BROAD STREET, NEW YORK, AT 41 MAY 12 AM 5 03 STANDARD TIME

K110 TEHERAN 13 11 2010

LC DUCELEX NEWYORK =

YOURS 6/3 DISPATCH FEWMETRES SAMPLES EACH

COLOUR AND QUALITY =

ECE

6/3

FN, 19 M 3130

Telephone: HAnover 2-1811 To secure prompt action on inquiries, this original RADIOGRAM should be presented at the office of R.C.A. COMMUNICATIONS, Inc. In telephone inquiries quote the number preceding the place of origin

Form 112 TA-[illegible]

5504 1711

Defendant's Exhibit No. 810

CLIPPER MAIL

May 19, 1941
Dict 5/16/41

E. C. E. Etablissements due Commerce
et d'entreprise
Boite Postale 33
Teheran, Iran

Gentlemen:

Complying with your cable request of May 11th, we are sending you three sheets each, approximately one meter square, of the following:

300 MST (Moistureproof heat-sealing transparent)
300 P T (Plain, non-moistureproof, transparent)
300 P C (Non-moistureproof, regular colors)

Samples of the moistureproof colors are not available at this office but they may be had in the same colors as the non-moistureproof colors.

There are two lots of samples being sent you on separate boats so that if one doesn't reach you, the other should.

We are very pleased to have received this request from you and will be glad to be of further service so please feel free to call upon us at any time.

Very truly yours,

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

SS

FILE COPY

5/26
6/3

M 3129

Fn. 19

5505 712

Defendant's Exhibit No. 811

FR 10177

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

FOREIGN RELATIONS DEPARTMENT

March 25, 1941

Messrs.
G. H. Andrews, "Cellophane" Division, New York
A. I. Brown, Fabrikoid Division, Newburgh, New York
T. L. Dunnell, Viscose Division, New York
C. A. Grasselli, II, Foreign Relations Department, Wilmington
H. G. Kuehler, R. & H. Chemicals Department, Building
W. J. Schappa, Grasselli Chemicals Department, New York
T. H. Urmston, Acetate Division, Nemours Building
J. P. Wills, Organic Chemicals Dept., Nemours Building

Attached hereto is copy of letter received from Mr. Heakel D, Schemtob, Abakhanah Street, Baghdad, Iraq, from which you will note that he is interested in representing our various departments in Iraq.

If you are interested in such a connection kindly communicate with Mr. Schemtob direct.

We have acknowledged the letter from the applicant, and if you have no interest it will not be necessary for you to so advise Mr. Schemtob.

FOREIGN RELATIONS DEPARTMENT

J. M. Quinn
J. M. QUINN

JMQ/L
Encl.

FILE
APR 9 1941
G. GONZALEZ

M 3136

FN. 15

BETTER THINGS for BETTER LIVING...THROUGH CHEMISTRY

Defendant's Exhibit No. 812

COPY

HESKEL D. SCHEMTOB

ABAKHANAH-STREET

BAGHDAD,

IRAQ.

12th of January 1941.

My Ref. 1676-HDS/FF

Messrs.
Du Pont, E.I., De Nemours and Co. Inc.,
Export Department
Nemours Bldg.
W I L M I N G T O N, DEL.-U.S.A.

Dear Sirs,

Wishing to extend my business-lines of chemical products in this country and knowing the International reputation of your
Chemicals
Dyestuff
Fabrikoids
Cellophane, and
Rayon / Nylon /,
I take the liberty of offering you my services as Agent for Iraq, having ascertained that you have no direct representation through any other channel.

My firm, deriving from our family's firm, established in 1895, possesses:
a/ the best of personal and business connections throughout the whole of the Iraqi market;
b/ traditional good repute and a sound financial basis. References will be given by: The Eastern Bank Ltd., Baghdad/ eventually through Brown Bros. Harriman Inc., New York/;
c/ the capacities and the organization to conduct such an representation in a manner that would, I have no doubt, prove mutually beneficial.

I shall be glad to hear if my proposal is acceptable to you, and if so, will you kindly indicate the general conditions and terms upon which you would be willing to entrust me with your representation.

Hoping to hear favourably from you,
I beg to remain,

Yours faithfully,

(S) Heskel D. Schemtob

FILE
APR 9 1941
G. GONZALEZ

M 3137

Defendant's Exhibit No. 813

CC - J. M. QUINN - Wilmington

AIR MAIL
April 8, 1941

Mr. Heskel D. Schemtob
Abakhanah Street
Baghdad, Iraq

Dear Sir:

Your letter of January 12th, 1941, Reference 1878-HDS/77, has been referred to us by our main office at Wilmington as this Division handles the sale of transparent cellulose film which is one of the items referred to in your letter.

There are several types of cellulose film manufactured by us. These include the original or basic film with which you are no doubt most familiar. It is used for the wrapping of candy boxes and many other items which require protection from dust, dirt, handling, etc. There is available another type of film which was invented by du Pont in 1927. This is known as the moistureproof variety. It is available in the transparent and colors as is the regular or non-moistureproof type of film. It is widely used as a wrapper on cigarettes, cigars, biscuits, crackers, etc., as it keeps moisture in or out of the product it envelopes to a very high degree of perfection. There is a third type of film which is basically different from the regular and moistureproof films. This film is waterproof to a high degree but it is not moistureproof. The main uses for it are in the surfacing of paper, the wrapping of paper products, light textiles, flower bouquets, etc. This product while having the same general appearance as the other products is not quite as strong as they are.

We are enclosing samples of the products mentioned as well as our price schedules applying thereto. Delivery on these items can be made promptly from our factory to the port of New York upon receipt of formal order. Owing to delays in obtaining shipping accommodations, it is not always possible to effect prompt shipment from the port of New York of which you are, no doubt, aware and will please take into consideration. Our prices are in U.S. Dollars with payment at New York by an approved bank on an irrevocable letter of credit basis upon delivery of documents. These documents would, if they were obtainable, be the ocean bill of lading but if for any reason we would be unable to obtain an ocean bill of lading, we would expect payment to be made against a warehouse receipt.

FN.15

M 3138

We are not in a position to make any formal appointments in Iraq at this time but we shall for the present be willing to support you to the extent we can by allowing you our regular agents commission of 10% on any business which you might send us which is completed. This offer is a tentative one and subject to withdrawal at any time.

Your letter lacks particulars about your organization, personnel, finances, products sold, names and addresses of manufacturers you now represent, etc., etc. For the purpose of helping us become better acquainted with your organization we would appreciate it if you please write us fully in reference to the foregoing items and any other items which you believe will be of interest to us.

Very truly yours,

G. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

gg
Encs.

FILE COPY

FILE
APR 9 1941
G. GONZALEZ

M 3138

FN. 15

Defendant's Exhibit No. 814

March 26, 1941

Mr. Enno F. J. Nater
% Winter & Lauerman, Inc.
106 Wall Street, N
New York, N. Y.

Dear Mr. Nater:

In confirmation of our conversation relative to the sale of products of this Division thru your principals in the Netherland East Indies, we are submitting the following information and material.

Cellulose Film: This product, as you know, is widely employed in this country as a wrapping material primarily but it also has characteristics which make it useful in other directions. It is available in three distinct types. The most important being the moistureproof, which is used on cigarettes, cakes, etc.; the next, the non-moistureproof or orginal material and which, incidentally, may be of more interest in the Netherland East Indies than here; and the third, or last, being our C.A. film which is waterproof (not moistureproof) and used for laminations, windows in envelopes, boxes, etc.

The gauge or thickness of the film to use depends on the object being wrapped but we find that the lightest gauge constitutes perhaps 95% of the volume. The element of cost may influence this for the heavier the gauge the more expensive is the material. We are enclosing some samples, literature and price schedules giving further particulars.

Cellulose Seals: This product is used as a secondary closure on bottles and, in addition to enhancing the appearance of the package, it also contributes in a large measure to the prevention of falsification and pilferage. This product also prevents the "backing off" of primary closures of the screw cap type, particularly those made of plastics which do not conform under pressure. Our experience has been that seals of the band type are suitable for most operations and prefer to sell these to the caps, which are much more expensive and do not have the possibilities from the standpoint of designs, etc. Samples, literature and price lists are enclosed.

Cellulose Sponges: This is a comparatively new item with us but it is possible that your people may be familiar with them

FN

M 3249

(COPY OF ILLEGIBLE [redacted])

as similar sponges were made in Germany and France until a year ago. This item is available in two types or degrees of fineness. One is our Standard Pore type which is a general all-purpose sponge, and the other is our Fine Pore sponge, which is used for more particular work such as drying photograph negatives, shoe daubers, full-fashioned hosiery machines, stamp pads, pottery, etc. Samples, literature and prices are enclosed.

The foregoing information is rather sketchy but it will give your principals a general idea of the materials we produce. We are in a position to offer your principals the agency for these products in the Netherland East Indies on a tentative basis subject to a review of the matter after a trial period of six months from date. The agency commission during this trial period would be 5% on film, 10% on seals and 10% on sponges. The commission on film would be subject to revision under a formal agency agreement.

It would be much appreciated if you will forward this data to your principals via the quickest practical route and that you have them advise by cable their decision in the matter.

Should they be favorably disposed, it would be desirable for them to order a quantity of film and a quantity of sponges for stock. I shall be pleased to help you develop a nominal order if you so desire.

Appreciating your courtesy in visiting with us and awaiting your further word, we remain

Very truly yours

G. H. ANDREWS, Manager
EXPORT SALES DIVISION

GHA:TL M3249
In triplicate

6 sheets each PHT (33gram); PT, MST, PC(all colors) #88, #100 #150 C.A
samples price lists, literature, on sponges, film, seals
3"Cellophane" sample books.
unmounted sponge ads (6)
3 fine & standard pore sponges FM.9

Defendant's Exhibit No. 815

Winter & Lauerman, Inc.

120 WALL STREET
NEW YORK, N. Y.

BUYING AGENTS FOR THE

CABLE ADDRESS "LAUERWIN"

N. V. INTERNATIONALE CREDIET-EN HANDELS-VEREENIGING "ROTTERDAM" HEAD OFFICE BATAVIA, JAVA., N. E. I.

May 27, 1941

E. I. DuPont de Nemours & Co., Inc.
Cellophane Division
350 Fifth Avenue
New York, N. Y.

Attention: Mr. G. H. Andrews

Dear Sirs:

We are very sorry to inform you that the following cable reached us today from our principals in Batavia.

"Cellophane trial order impossible, owing to fresh exchange difficulties. Airmailing details."

Upon receipt of further particulars by airmail we shall, of course, submit them to you at once, but in the meantime we fear that we shall have to accept the fact that on account of new Exchange Regulations issued by the Netherlands East Indies Government, business in Cellophane is not possible for the time being.

Yours very truly,

WINTER & LAUERMAN, INC.

W. D. Lauerman

W. D. Lauerman, Secretary

EAS/TMA

M 3127

JUN 4 '41
G. GONZALEZ

FN. 21

Defendant's Exhibit No. 816

June 2, 1941
(Dict. 5/28/41)

FILE COPY

Winter & Lauerman, Inc.
120 Wall Street
New York, N. Y.

Attention of Mr. W. D. Lauerman

Dear Mr. Lauerman:

This will acknowledge and thank you for your letter of May 27th advising that it is impossible for N. V. Internationale Crediet en Handels, Vereeniging "Rotterdam", Batavia, to order film owing to fresh exchange difficulties.

We are very sorry to learn this and will appreciate it if you please let us have further details when you hear from your principals.

Very truly yours,

G. H. ANDREWS, Manager
"CELLOPHANE" EXPORT SALES

SS

M 3126

FILED
JUN 4 1941
G. GONZALEZ

FN. 21

Defendant's Exhibit No. 817

AIR MAIL

April 9, 1941

Joseph & Maurice Levy
38, Rue du 1er Khedive
Alexandria, Egypt

Gentlemen:

This will acknowledge receipt of copy of your letter of February 22 asking us to cable you in reference to a repeat on your order for Eliakim. Before being able to reply to this letter, we received your cable of today asking us to ship thirty cases and this will be taken care of in accordance with your directions of which you will be duly advised by cable which shall reach you before this letter.

There has been no change in price on cellulose film of our manufacture since the last order you submitted so the price, terms and conditions will be the same as before. There is no change in price contemplated at the moment with respect to the immediate future but in case there should be, we shall most certainly call the matter to your attention.

With reference to the letter of credit which will be issued to cover the present order, we hope you will have made arrangements to issue it without including therein the trade mark "Cellophane". If this mark should by any chance happen to have been included, will you please make due note that it should not appear on letters of credit or other papers in the future because we don't own the trade mark "Cellophane" in Egypt.

Due note has been taken of the reference you have made to the effect that prices on U. S. film are about 5% to 6% less than these which we have quoted you. We have no knowledge of any sales of our material having been made to Egypt at prices lower than these which we have quoted you but that does not necessarily mean that such a condition could not have occurred. We have no control over prices, etc., beyond our immediate organization and for that reason variances may occur as you have pointed out to us.

Very truly yours,

C. H. ANDREWS, Manager
CELLULOSE FILM EXPORT SALES

ss

M 3142 FN. 12

Defendant's Exhibit No. 818

CC: C. F. BROWN
[illegible]

July 10, 1941

TO: W. A. DENEER, PRES.
DU PONT S. A.
MEXICO

FOR: R. J. BLACK

FROM: G. H. ANDREWS

FILE COPY

This will acknowledge receipt of the circular of June 20 of Mees e Hijos, Londres 52, Mexico D. F., in which they offer "papel cristal" of British Cellophane Ltd.

It is rather interesting to us to note that it is possible for the British to deliver film in Mexico and we appreciate your interest in referring this circular to us.

You may have noticed that in this circular Mees e Hijos make reference to "papel glassine super-transparente Cellosheen". This word "Cellosheen" seems to be rather close to our registered trade mark "Cellophane" and you might wish to call this to the attention of your patent attorneys.

GHA:TL

M 3261

Defendant's Exhibit No. 819

MEES e HIJOS

LONDRES 52

A.B.C. CODE 5TH. EDIT.
BENTLEY'S CODE
CABLE: "GLYCIN"
TEL. ERIC. 18 79-11

MEXICO, D. F. Junio 20, 1941.
APARTADO 7178

Muy estimados Señores,

Nos tomamos la libertad de recordarles que, en nuestra calidad de representantes de la acreditada fábrica:

The Deerfield Glassine Company, Inc., Monroe Bridge, Mass.

estamos en condiciones de surtir, en la mejor forma posible, las necesidades -- que Uds. puedan tener de los siguientes artículos:

PAPEL GLASSINE No. 1, tonos B, P y O
" " en colores
" " labrado
" a prueba de grasa

y

Papel Glassine super-transparente CELLOSHEEN

Si se deseare contar con un papel para envoltura de precio especialmente bajo y que tenga, sin embargo, las características fundamentales de un buen glassine, podemos ofrecer además el papel denominado

Sulglass

que puede venir también en todos los pesos del Papel Glassine No. 1, pero con un costo bastante más reducido.

Como representantes directos de fabricantes de primer orden, podemos ofrecer además, en condiciones muy ventajosas los siguientes papeles:

Producto	Fabricante.
Papel cristal blanco y de colores, de alta calidad, tipo normal y a prueba de humedad	BRITISH CELLOPHANE LTD.
Papeles parafinados blancos y de colores	THE HENLE WAX PAPER MFG Co.
Papeles corrugados finos	SHERMAN PAPER PRODUCTS CORP.
Papeles de estaño puro y combinaciones de plomo y estaño	THE JOHNSTON TIN FOIL & METAL COMPANY

Mucho les hemos de agradecer que, cuando se encuentren en el mercado, en busca del producto aludido, tengan a bien pedir también n/ oferta, en la seguridad de que podemos servirles a su entera satisfacción.

Nos repetimos sus afmos. attos. amigos y bien Ss. Ss. -

Mees & Hijos

FN.58 M 3262

Defendant's Exhibit No. 820

FORMA 17-[illegible]

DU PONT

MARCA IND. REG.
FUNDADA EN [illegible]

DU PONT, S. A.

"EDIFICIO CIDOSA"
AVENIDA URUGUAY NO. [illegible]
MEXICO, D. F.

October 1st, 1941.

VIA AIR MAIL.

PERSONAL.
CONFIDENTIAL.

TO: MR. G. H. ANDREWS, EXPORT MGR.,

FROM: MR. R. J. BLACK.

For your very confidential information, we are attaching copies of invoices of the British Cellophane Ltd., covering a sale of transparent film to Messrs. M. E. Mees e Hijos of Mexico City.

We wish to inform you that this order arrived in Veracruz on the S.S. Monterrey on August 11, 1941, having evidently been transshipped in New York from the English S.S. "Egipcian Prince".

Some months ago I forwarded you a broadside distributed by Mees, offering products of the British Cellophane Ltd.

RJB/ala

M 3263

FILED
OCT [illegible]
G. GO[illegible]EZ

FN. 58

Defendant's Exhibit No. 821

INVOICE

BRITISH CELLOPHANE LIMITED

BATH ROAD
BRIDGWATER (Som.)

MESSRS. MEES E HIJOS
APARTADO 7178
MEXICO CITY
MEXICO
LONDRES #52.

2ND JULY 1941.

CIF VERACRUZ INCLUSIVE OF WAR RISK INSURANCE CASH AGAINST DOCUMENTS IN MEXICO CITY THROUGH THE BANCO DE LONDRES Y MEXICO LESS 1 1/2 % DISCOUNT.

Your Order No.	Our Order No.	Carriage	Price per	Ref.No.	TOTAL
EX LETTER OF. 9.5.41	2849	ROAD TRANSPORT 2.7.41	1,000	X.1198/1	

TRANSPARENT CELLULOSE WRAPPINGS MADE IN BRITAIN.

15,000 PCS. PLAIN TRANSPARENT 300. 90 x 100 cms. 21.20 $ 318.00 $

PACKED IN WOODEN CASES AND DESPATCHED PER ROAD TRANSPORT ON 2.7.41 FOR SHIPMENT PER S.S. "ARABIAN PRINCE"

CASE NOS.	GROSS WT. LBS.	GROSS WT. KILOS	LEGAL WT. LBS.	LEGAL WT. KILOS.	NET WT. LBS.	NET WT. KILOS	DIMENSIONS	CONTENTS REELS.
1	403	182,80	345	156,49	324-14	147,36	(44 x 39 x 8 3/4" (112 x 99 x 22 CMS.)	5,000
2	402	182,34	345	156,49	324-13	147.33	" " " "	5,000
3	406	184,16	345	156,49	324-13	147.33	" " " "	5,000

"I DECLARE THAT THIS INVOICE IS CORRECT AND THAT A SEPARATE INVOICE HAS NOT BEEN AND WILL NOT BE GIVEN FOR ANY PORTION OF THESE CHARGES."
BRITISH CELLOPHANE LIMITED. (firma illegible)

MEES
C'LESS
MEXICO CITY
VIA-
VERA CRUZ
NOS. 1/3.

TOTAL: 3 Bultos.

MADE IN ENGLAND
Z/B 1/1/1/4/TER/117
80.

M 3264

INVOICE

B R I T I S H C E L L O P H A N E L I M I T E D

BATH ROAD
BRIDGWATER, (Som.)

MESSRS. MEES E HIJOS
APARTADO 7178
MEXICO CITY
MEXICO
LONDRES #52

2ND JULY 1941.
C.I.F. VERACRUZ, WR RISK INSURANCE INCLUDED
CASH AGAINST
DOCUMENTS IN MEXICO CITY THROUGH THE BANCO
DE LONDRES Y MEXICO, LESS 1 1/2% DISCOUNT.

Your Order No.	OUR ORDER No.	Carriage	Price per	REF. No.	TOTAL
EX LETTER OF 9.5.41.	2850	ROAD TRANSPORT. 2.7.41.	1,000	X.1197/2	

TRANSPARENT CELLULOSE WRAPPINGS - MADE IN BRITAIN.

12,500 SHEETS. PLAIN TRANSPARENT 300. 90x100 CMS.		21.20	265.00$

PACKED IN 3 WOODEN CASES AS UNDER AND DESPATCHED PER ROAD TRANSPORT ON 2.7.41 FOR SHIPMENT PER S.S. "ARABIAN PRINCE".

CASE NO.	GROSS WT. LBS.	GROSS WT. KILOS	LEGAL WT. LBS.	LEGAL WT. KILOS	NET WT. LBS.	NET WT. KILOS.	DIMENSIONS	CONTENTS REAMS
4	397	180,08	349	158,30	329-6	149,40	(44 x 39 x 8 3/4") 112 x 99 x 22 CMS.)	5,000
5	388	175,99	349	158,30	329,6	149,40	" " "	5,000
6	224	101,60	175	79,38	164,12	74,73	(44 x 39 x 6 1/2")	2,500

"I DECLARE THAT THIS INVOICE IS CORRECT AND THAT SEPARATE INVOICE HAS NOT BEEN AND WILL NOT BE GIVEN FOR ANY PORTION OF THESE CHARGES."
BRITISH CELLOPHANE LIMITED. (FIRMA ILEGIBLE)

MEES
C'LESS
MEXICO CITY
VIA
VERA CRUZ
NOS. 4/6.

TOTAL : 3 BULTOS. MADE IN ENGLAND.

Z/B 1/1/4/TER/117.
80.

OCT 13 194

M 3265

INVOICE

B R I T I S H C E L L O P H A N E L I M I T E D
BATH ROAD.
BRIDGWATER, (Som.)

MESSRS. MEES E HIJOS
APARTADO 7178
MEXICO CITY
MEXICO.
LONDRES #52 — 2nd July 1941.

F.O.B. U.K. PORT. CASH AGAINST DOCUMENTS IN MEXICO CITY THROUGH THE BANCO DE LONDRES Y MEXICO. LESS 1 1/2% DISCOUNT.

EX LETTER OF				TOTAL
9.5.41	2853 ROAD TRANSPORT 2.7.41.	1,000 X.1198/2		
TRANSPARENT CELLULOSE WRAPPINGS-MADE IN BRITAIN.				
7,500 SHEETS.	PLAIN COLORED. 300. AMBER. 90 X 100 CMS.	28.70	$ 215.25 $	
	PLUS FREIGHT & MARINE INSURANCE		13.30 $	
			228.55 $	
	PLUS WAR RISK INSURANCE PREMIUM		7.49 $	
				236.04 $

PACKED IN 2 WOODEN CASES AS UNDER AND DESPATCHED PER ROAD TRANSPORT ON 2.7.41. FOR SHIPMENT PER S.S. "ARABIAN PRINCE".

CASE NO.	GROSS WT. LBS.	GROSS WT. KILOS	LEGAL WT. LBS.	LEGAL WT. KILOS	NETT WT. LBS.	NETT WT. KILOS	DIMENSIONS.	CONTENTS REAMS
7	400	181.44	332	150.59	312-0	141.52	(44 x 39 x 8 3/4") (112 x 99 x 22 CMS.)	5,000
8	232	105.23	166	75.30	156-0	70.76	(44 x 39 x 6 1/2") (112 x 99 x 17 CMS.)	2,500

" I DECLARE THAT THIS INVOICE IS CORRECT AND THAT SEPARATE INVOICE HAS NOT BEEN WILL NOT BE GIVEN FOR ANY PORTION OF THESE CHARGES."
BRITISH CELLOPHANE LIMITED.
(FIRMA ILEGIBLE)

MEES
AMBER
MEXICO CITY
VIA
VERACRUZ
NOS. 7/8.

TOTAL: 2 BULTOS. MADE IN ENGLAND.
Z/B 25/1/1/4/TER/117
80

M 3266

1941
7

FN 58

INVOICE

BRITISH CELLOPHANE LIMITED
BATH ROAD
BRIDGWATER (Som.)

MESSRS. MEES E. HIJOS
APARTADO 7178
MEXICO CITY
MEXICO
LONDRES #52

2ND JULY, 1941

F.O.B. U.K. PORT. CASH AGAINST DOCUMENTS IN MEXICO CITY, THROUGH THE BANCO DE LONDRES Y MEXICO. LESS 1 1/2% DISCOUNT.

EX LETTER OF - 1,000 X .1197/1. TOTAL
9.5.41 2857 ROAD TRANSPORT 2.7.41

TRANSPARENT CELLULOSE WRAPPINGS - MADE IN BRITAIN

5,000 SHEETS. PLAIN COLORED. 300. AMBER. 90 x 100 CMS. 28.70 $ 143.50 $

PLUS FREIGHT & MARINE INSURANCE 8.56 $
152.06 $
PLUS WAR RISK INSURANCE PREMIUM 5.07 $

$157.13

PACKED IN 1 WOODEN CASE AS UNDER AND DESPATCHED PER ROAD TRANSPORT ON 2.7.41. FOR SHIPMENT PER S.S. "ARABIAN PRINCE"

CASE NO.	GROSS WT. LBS.	GROSS WT. KILOS	LEGAL WT. LBS.	LEGAL WT. KILOS.	NET WT. LBS.	NET WT. KILOS.	DIMENSIONS
9	400	181,44	332	150,59	312-8	141,75	(44 x 39 x 8 3/4" 112 x 99 x 22 cms.)

" I DECLARE THAT THIS INVOICE IS CORRECT AND THAT A SEPARATE INVOICE HAS NOT BEEN AND WILL NOT BE GIVEN FOR ANY PORTION OF THESE CHRGES."
BRITISH CELLOPHANE LIMITED. (Firma ilegible.)

MEES
AMBER
MEXICO CITY
VIA
VERACRUZ
NO. 9

TOTAL: 1 Bulto.

Made in England.
s/B 25/1/4/TER/117.

M 3267

OCT 13 1941

FN 58

Defendant's Exhibit No. 823

"LAMBERTPRO"
CABLES
ACME CODE

TELEPHONE
MU 3287

LAMBERT PRODUCTS
PTY. LTD.

GENERAL MERCHANTS
IMPORTERS AND EXPORTERS
MELBOURNE, C.1
(AUST)

Registered Office
"VICTORIA HOUSE"
44 Queen Street,

CONFIDENTIAL.

24th May, 1945.

Messrs. E. I. Du Pont de Nemours & Co,
"Cellophane" (Clar-Apel) Export Sales,
350 Fifth Avenue,
NEW YORK, U.S.A.

Dear Mr. Andrews,

For the attention of Mr. C. H. Andrews.

Subj.matter: SURVEY AUSTRALIAN CONVERTERS OF FILM.

We now acknowledge and reply to your letter of March 19th, where you requested a survey of Australian converters. We want you to know that Australian commercial houses, manufacturers and traders are very conservative and are not helpful in co-operating with one another for the benefit of Australian business generally. They jealously guard present activities and their post war and future plans. However, we now have pleasure in reporting on the largest converters in Australia.

VICTORIA. CHAS. STEELE & CO.PTY.LTD. Managing Director Mr. J. B. Fletcher. The writer personally visited the factory, tabled your letter of the 19th March and discussed the matter with Mr. Fletcher. There is not a more conservative trader in Australia than this House.

However, our conversations were very pleasant and we quote Mr. Fletcher's letter of the 16th April,45.
"Following our conversation with your Mr. Duncan this day we appreciated "the opportunity of perusing a letter you have received from Du Pont in "which our name is mentioned as one of the Converters of Cellulose Film "in this Country.
"We are arranging for one of our Technical Men to visit U.S.A. immediately " and he will have instructions to discuss the question of supplies of "various types of Film with Du Pont.
"We are not prepared to disclose at the moment what our ideas are, but "for further information regarding this Company Du Pont could refer to our "American Associates, Shellmar Products Co., Mt. Vernon, Ohio, under whose "guidance we are operating here."

50

This House is very well equipped with up-to-date automatic machinery for the converting of Film. They use reels only and their work is excellent and we consider comparable with anything overseas. We estimate their pre-war consumption of film as approximately fifty tons per annum, but their units are capable of handling one hundred tons per annum in an eight hour day, and we presume for the post-war period they are going to interest themselves very much in the conversion of Film. The above as being about 25% of their business. They are also multi-color printers doing high

M 3068

LAMBERT PRODUCTS PTY. LTD.

CONFIDENTIAL.

VICTORIA: CHAS. STEELE & CO. PTY.LTD. (Continued)
class work and manufacture Calendars, Paper Boxes, Show Cards, Novelties, etc.

We estimate that approximately 50% of their converted film is sold in Victoria. The balance throughout the States of the Commonwealth.

WRIGHTCEL PRODUCTS PTY.LTD. This House is the most progressive converter of Film in Australia, and specialises in the converting of Cellulose Film only. No other allied lines whatsoever. Head Office and factory in Victoria. Since the outbreak of War they have also opened and established an up-to-date factory Sydney, New South Wales.

Victorian Equipment. -Rotary multi-color aneline printing, rewinding, sheeting machines.
-Automatic bag units for non-moistureproof and moisture-proof film.
-Special Slitting and rewinding units
-Wax Coating equipment.
-Semi-automatic crimping units
-Hand fabricating department

Present consumption of film- Approximately 2 tons weekly
Distribution - Victoria, South Australia, West Australia.
Future Plans.- Installation new printing process for high class work.
- Transparent rigid containers.

Sydney Equipment. Same as above
Present consumption of film.- 1 ton weekly.
Distribution - N.S.W., Queensland and export.
Future Plans.- As Melbourne.

H. GEE. (This is a subsidiary company of Wrightcel Products Pty.Ltd. Melbourne)
Converters transparent film, glassine, paper bag manufacturers, paper merchants.
Equipment - Flat bed printing machines, Hand Fabricators.
Future Plans- Suppliers of retailing lines and sundries including cellulose ribbons, tapes, closures, etc.
Merchants of sheet and reel film, cut to size sheets, design sheeting etc.
Distribution - All States

SYDNEY, NEW SOUTH WALES.
PRINTERS PTY.LIMITED. This Company installed a German Rotary Press employing the aniline process in 1937, and up to the time of supplies of Cellophane being stopped, had made considerable development in the printing and processing of Cellophane, their product being considered first quality.
Nearly all the Cellophane used was moistureproof and in reels, and from the information we have been able to collect re consumption of Cellophane over eighteen months, it would appear that they process about two tons per month.
Mr. Clayton, Chairman of Directors, said they are very interested in post-war possibilities with Cellophane, and he is of the opinion that his Company must expand their activities with this product.
During the War Cellophane has been made available to them under license from the Division of Import Procurement, but there has not been sufficient to fully employ their machine and they have as a result been using Glassine and other papers such as M.G. Manilla and Kraft.
No indication was offered as to what machinery they might be interest in post-war, preferring to await developments, but have asked to be kept informed of

LAMBERT PRODUCTS PTY. LTD.

To E. I. Du Pont de Nemours & Co. 24th May, 1945. 19 Sheet No. Four

The above converters were using approximately 40% Moistureproof and 60% P.T., but post-war there will be a swing over to Moistureproof.

The conversion to bags and envelopes, wrappers, etc. was for a very limited range for the confectionery and textiles trade, but the manufacturers in Australia generally have become very film minded and we expect big step up in the post war period.

TOBACCO TRADE. Cigarette and Tobacco Manufacturers in Australia pre-war were consuming approximately 400 tons per annum. Most of these manufacturers have their own slitting and sheeting machines and all use the Rose Wrapping Machine. They use Moisture-proof only.

Apart from the above, we have approximately twenty manufacturers whose purchases average five tons per annum. Then we sell to all the paper distributing houses in Australia whose purchases each average approximately 150 reams of 40 x 40.

We trust the above information will be helpful to you in assessing our contribution to the packaging service necessary to industry in Australia.

We now request that you render us a return service by keeping us fully informed of the latest developments so as to allow our plans for the future to reach fruition. In this respect we want from you at your earliest possible moment particulars of new types of film you are making or intend to manufacture, new fields which you anticipate cellulose will cover, new equipment to convert the film and hundreds of samples which will convey to us in a practical way how we can interest Australian consumers.

Up to the time of writing our Government is maintaining the restricted uses of Film for Government purposes only, and we regret having to inform you that we cannot predict when the regulations of restricted use will be somewhat lifted. However, in this matter we will keep you closely posted. Please cable us when you have tonnage of plain and colored available for export to Australia.

Awaiting with interest your advices,

Yours faithfully,

LAMBERT PRODUCTS PTY. LTD.

C. E. DUNCAN

P.S. JAPANESE FILM. The tonnage imported was very small and ceased in 1937. From then on all importations from U.K.

✓ Defendant's Exhibit No. 824

EXTRACT FROM MONTHLY REPORT-OCTOBER 1947

3557

cc: W. J. Harte- R. R. Smith
E. C. Lake - L. B. Steele - H. P. Sett
W. G. Hunter
J. E. Dean - File

E. I. du Pont de Nemours & Company

Wilmington 98, Delaware

Rayon Department
Cellophane Division

November 5, 1947

TO: A. [illegible]
[illegible]

FROM: C. F. BROWN

MONTHLY REPORT - OCTOBER 1947

Export

Sylvania increased export prices effective November 1st, 1947. Their new schedule of prices parallels the change which we made October 1st, 1947.

A substantial quantity of sheets has been offered to our foreign distributors for delivery in December. The response to these offers to date has not been encouraging. Shortage of dollars appears to be the principal obstacle, also the greater availability of B.C.L. film which doesn't require dollars is proving to be a handicap.

No 3561

Defendant's Exhibit No. 825

November 14, 1947

AIR MAIL
On Lok Yuen Co., Ltd.,
25 Des Voeux Road, Central,
Hong Kong.

Attention: Mr. John Cheung - Manager.

Gentlemen:

Supplementing our letter of June 19, 1947, we have some 300 MST heat-sealing moistureproof cellulose film available in stock size sheets, measuring 40" long by 40" to 48" wide for December delivery and although you can hardly prepare an order for handling as soon as that, the thought occurs to us you might wish to do so on the basis that another lot may become available in the near future.

The material is priced at $.03 per 1,000 square inches, F.A.S. New York for full cases of 5,000 sheets - 10 packages of 500 sheets. The sheets in all packages would be the same size, but there would be an assortment of sizes in the case within the limits indicated in paragraph 2.

The 300 MST film is widely used for packaging bakery products. It is a moistureproof film of the heat-sealing variety. It seals in about the same way as waxed paper. The tools for sealing are simple and in this connection we enclose a folder showing machines made by Pack-Rite. If you should order any film and desire a few sealers, we should be pleased to buy them for you.

It would be necessary for us to quote you on the basis of Confirmed Irrevocable Letter of Credit in New York and in issuing the Letter of Credit we suggest it be valid for 180 days. The product term is "Transparent cellulose film for wrapping" - do not use the trade-mark Cellophane. Also you might have your bank follow the general direction sheet attached.

We presume that any licenses for import, etc. would be taken care of by you prior to the placing of the order. In case you can develop an order within the next 30 days, prompt shipment could be made. Beyond that there might be a delay as we have been given no assignment, as yet, beyond December.

Very truly yours,

M 3243

C
Attachments

G. H. Andrews,
Manager - Export Sales.

FN. 2

QUANTITY ORDERED

2200#

12

USE

✓ Defendant's Exhibit No. 826

Cellophane

E. I. duPONT de NEMOURS & COMPANY
INCORPORATED

DUPONT

Cellophane Division

MANUFACTURERS OF CELLULOSE FILM...

CB 12/18/47 CO:39:1

SOLD TO
ON LOK YUEN CO., LTD.
25, DES VOEUX ROAD, CENTRAL
HONG KONG, CHINA

SHIPPED TO
E I DU PONT DE NEMOURS & CO
% T SMITH & SONS
1011 MARITIME BLDG
NEW ORLEANS L A

B/L NO	SHIPPED	VIA	TERMS	DATE	
9557	12/31/47	T C PPD	CASH IN ADVANCE	12/29/47	CX017990
C CODE 17956	TRADE 747	SHIPPED FROM OLD HICKORY	F.O.B. [illegible]	CUST ORDER 535/47	CO 39207

F.A.S. PORT OF EXIT

ROLLS ARE PRICED PER LB.
SHEETS ARE PRICED PER M SQ. IN.

NO CLAIMS ALLOWED IF MERCHANDISE HAS BEEN TREATED OR PROCESSED IN ANY MANNER

TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

ROLLS OR SHEETS	NUMBER	DESCRIPTION OF CELLULOSE FILM OR CELLULOSE ACETATE FILM	SIZE	POUNDS OR SQ. IN.	PER SQ. IN.	AMOUNT
SHEETS				SQ.MTRS.	SQ.MTR.	
25,000	300	MST-51 (PREFERED)	40" 40" X [illegible]	40000	.03	1200.00
		GROSS WT 2346# FRT RATE .803			FRT FROM O H	18.84
		JANUARY PROJECT = 2200#				

→ PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE	TERMS	FOR INFORMATION OF SHIPPING PLANTS ONLY SHIP VIA	FREIGHT EQUAL	SHIPMENT REQUIRED
22	CASH IN ADVANCE	PPD.		12/26 W

INSTRUCTIONS
USUAL BILL & HOLD INSTRUCTIONS.
PACK IN CASES.
[illegible] LABELS

FINAL DESTINATION: HONG KONG, CHINA

STOCK DISBURSEMENTS
O L Y CO
HONG KONG
535/47
#1/UP

[illegible]
300S MST 51 1940.2# 1200.00

FN. 2 M 3244 (5527-1767)

Defendant's Exhibit No. 827

Oy G.W.SOHLBERG Ab

HELSINKI 8
VUORIMIEHENKATU 29
PUH. 20671 VAIHDE. SÄHKEOS: "SOHLBERGIT"

GWS

POSTISIIRTOT. 6369
K.O.P. Nro 10313/131
CODES: ABC 7th Ed. BENTLEY'S 2nd Ed.

HS/VA

HELSINKI 8
Finland

November 15th 1947.

E.I. DU PONT DE NEMOURS & COMPANY,
Incorporated
Rayon Department,
Empire State Building,
New York 1, N.Y.

ORDER № 06684/47

Re: transparent cellulose film.

Gentlemen:

Thanking you for your quotation of October 15th we herewith beg you to enter the following order for

Transparent Cellulose Film,

5,000 Sheets - Size 39-1/2" x 43" (1003 x 1092 m/m)
of your № 600 gauge PT-PUT stock having a thickness of approximately 0.0432 m/m., as per samples sent by you,

at a price of $ .0806 per square meter

F.A.S. New York

Terms: Irrevocable Letter of Credit through an established New York bank.

Delivery: Prompt shipment as soon as the Letter of Credit is put in order.

The goods are to be forwarded through our forwarding agents, Messrs. VICTORY SHIPPING CO INC., 8-10 Bridge Street, New York.

At the same time we ask for a Proforma Invoice in order to make necessary arrangements for Letter of Credit etc.

We beg to point out that this first order is to be considered as a trial order.

Waiting for your Proforma Invoice by return and your confirmation of this order, we are

Yours faithfully,

Oy G. W. SOHLBERG Ab

[signature]

200 [illegible]
7 7/8
305 [illegible]

BY AIR MAIL

FN. 5 12" [illegible]

M 3238

Nro 1. [illegible]

Cellophane **E. I. duPONT de NEMOURS & COMPANY** INCORPORATED

DUPONT

CB 5/7/48

C045235

Cellophane Division

MANUFACTURERS OF CELLULOSE FILM...

SOLD TO
OY G2 W8 SOHLBERG AB
VURIMIEHENKATU 29
HELSINKI E, FINLAND

SHIPPED TO
VICTORY SHIPPING CO INC
SWEDISH AMERICAN LINE
PIER 95
NORTH RIVER NEW YORK

B/L NO	SHIPPED	VIA	TERMS	DATE	INVOICE NO
4796	5/16/48	SS PPD	CLEAN S/D	6/11/48	CXO-[illegible]356
CODE	TRADE	SHIPPED FROM	F.O.B.	CUST. ORDER	OUR ORDER
	776	OLD HICKORY TERMS	OLD HICKORY FRTS PPD & ALLOWED TO [illegible] NEW YORK	6930/47	CB 45235

ROLLS ARE PRICED PER LB. SHEETS ARE PRICED PER M SQ. IN. — NO CLAIMS ALLOWED. DECK TREATED OR PROCESSED IN ANY MANNER — TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	NUMBER	DESCRIPTION OF CELLULOSE FILM OR CELLULOSE ACETATE FILM	SIZE	POUNDS OR M SQ. IN.	PRICE	AMOUNT
KILOS					KILOS	PER KILO	
500	30	600	PUT-77	12"	492.40	1.0066	574.14
1102			GROSS WT 1203# FRT RATE 2.00 DELY CHG .30				
30 R	DO NOT SHIP OVER $600.00 (L/C IS LIMITED TO $600)						
	SHIP UNDER GENERAL LICENSE R "GRO"						
	SHOW ON INLAND B/L "STOW UNDER DECK"			FRT FROM O H			25.02
				DELIVERY CHARGE			3.61
				25233			
				X-12516			

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE. INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

FOR INFORMATION OF SHIPPING PLANTS ONLY

DATE	TERMS	SHIP VIA	FREIGHT EQUAL	SHIPMENT REQUIRED
5/11	CLEAN S/D	PPD		6/4 W

INSTRUCTIONS
USUAL BILL & HOLD INSTRUCTIONS
PACK IN TUBES

"EX-QUOTA = $[illegible]"

FINAL DESTN [illegible]
FINLAND

STOCK DISBURSEMENTS
SOHLBERG
FINLAND
6930/47
[illegible]

600R PUT 77 1085.7# 574.14

01 8305 FN.5 M 3239

Defendant's Exhibit No. 829

SOCIEDADE COLONIAL DE TABACOS, L.da

Fábrica Ultramarina

CAIXA POSTAL 1963

Telegramas: ULTRAMARINA

LUANDA - ANGOLA

Séde em LISBOA

AVENIDA DA LIBERDADE, 18-4.º

Luanda,
7th. October, 1947.

E. I. DU PONT DE NEMOURS & COMPANY, Inc.
Empire State Building
New York 1, N.Y.

Nr. 1544/947

Gentlemen,

We confirm our letter dated 29th. July, concerning our request about possibilities of supply of your "Cellophane paper film" in rolls for working of a "Scandia" wrapping machine ordered by this Factory to Messrs. Vernon H. Craggs, Inc., Baltimore.

In accordance with a suggestion given by these constructors and in order to gain time, we are sending you our small Order Nr. 87/947, for 70 rolls of cellophane of quality equal to the samples sent to Messrs. Vernon H. Craggs, Inc. with your letter dated 14th. August.

These rolls are of 111 m/m (4 3/8") width. The other measure (86 m/m) will remain for a further command.

For payment of this order, please inform us, by cable, of which the total amount, in order to open an irrevocable credit on your favour, through The National City Bank of New York.

The sending of these rolls can be effected, in case of possibility, at the same time that the "Scandia" machine. In this direction, we beg you the kindness to contact Messrs. Vernon H. Craggs about the approximative date of its delivery.

Thanking you in advance and awaiting with all interest your further news, believe us, Gentlemen,

Very truly yours,

G.M.=

13.12.70

918.75

FN. 47 M 3123

Defendant's Exhibit No. 830

November 12, 1947

AIR MAIL
Sociedade Colonial de Tabacos, Fabrica Ultramarina,
Caixa Postal 1263,
Luanda, Angola, Portuguese West Africa.

Gentlemen:

Thanks very much for your letter of October 7th enclosing your order #67/947 covering 70 rolls - 111 m/m wide, 300 MST cellulose film.

The price of this material is $.48 U.S., per pound, F.A.S., New York and we shall be pleased to have you issue a Confirmed Irrevocable Letter of Credit on an established New York Bank for the value of approximately 920 pounds, plus 15% to cover, freight, insurance, etc.

Kindly issue the Letter of Credit for transparent cellulose film for wrapping purposes (do not mention the trade-mark Cellophane). You might have your bank follow the suggestions in the enclosed leaflet when issuing the Letter of Credit.

We have no information on the delivery of the Scandia machine, but would prefer to make direct shipment in accordance with your directions.

It is our understanding you do not wish any 86 m/m width rolls at this time.

Very truly yours,

C
Enclosure

G. H. Andrews,
Manager - Export Sales.

P.S. May we ask that you please allow 6 months dating on the Letter of Credit. We sincerely hope to affect shipment well within this time, but wish to be on the safe side.

cc - Vernon H. Craggs, Inc.,
330 North Charles St.,
Baltimore 1, Maryland.

M 3124 FN 47

Defendant's Exhibit No. 831

Defendant's Exhibit No. 37

Cellophane E. I. duPONT de NEMOURS & COMPANY INCORPORATED

CB 1/3/47 040468

DUPONT Cellophane Division

MANUFACTURERS OF CELLULOSE FILM

SOLD TO
SOCIEDADE COLONIAL DE TABACOS LTDA.
CAIXA POSTAL 1263
LUANDA, ANGOLA, PORTUGUESE WEST AFRICA

SHIPPED TO
E I DU PONT DE NEMOURS & CO
% AMERICAN WEST AFRICAN LINE
PIER 36
BROOKLYN NEW YORK

S/L NO.	SHIPPED	VIA	TERMS	DATE	INVOICE NO
505	2/3/48	S S PPD	S/D L/C	2/4/48	CXO-18023
6 ROLLS	TRADE	SHIPPED FROM	F. O. B.	CUST. ORDER	OUR ORDER
	706	OLD HICKORY	FAS A OR B PORT	67/947	CO 40468

ROLLS ARE PRICED PER LB. SHEETS ARE PRICED PER M SQ. IN. NO CLAIMS ALLOWED IF MERCHANDISE HAS BEEN TREATED OR PROCESSED IN ANY MANNER TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	NUMBER	DESCRIPTION OF CELLULOSE FILM OR CELLULOSE ACETATE FILM	SIZE	POUNDS OR M SQ. IN.	PRICE	AMOUNT
	ROLLS				KILOS	PER KILO	
919#	72	300	MST	111 M/M	422.40	1.0856	446.05
4 3/8"	72		GROSS EX WT. 1044#				
			FRT RATE 1.90				
			DELY CHG .30				
					KRR		
					FRT FROM O H		19.84
					DELY CHG		3.13
					BROKERAGE	5.00	
			JAN. QUOTA - 9[illegible]				

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE. INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE	TERMS	FOR INFORMATION OF SHIPPING PLANTS ONLY SHIP VIA	FREIGHT EQUAL	SHIPMENT REQUIRED
1/7	S/D-L/C	PPD.		1/29 W

INSTRUCTIONS
USUAL BILL & HOLD INSTRUCTIONS.
PACK IN TUBES.

FINAL DESTINATION: PORTUGUESE WEST AFRICA
01 8309

M 3126 FN. 47

STOCK DISBURSEMENTS
F T U
LUANDA
P W A
67/947
#1/2

300R MST 51 234.1# 112.10
300R MST 57 229.7# 109.98
300R MST 52 230.5# 110.40
300R MST 53 237.2# 113.57

Defendant's Exhibit No. 832

Lloydbrook 4612

COPY

H M S ASSOCIATES

47 Ossington Ave.
Toronto 3, Ont.

December 27, 1947

FILE
JAN 5 1948
E. A. WIGHT

E. I. DuPont De Nemours & Co.,
Rayon Department
Cellophane Div.,
Wilmington 98
Delaware, U.S.A.

att: Mr. E.A.Wight
Asst. Manager
Indirect Sales

Gentlemen:

Thank you for your letter of the 19th, December 1947, confirming your telegram of the 18th, December.

We make cellophane excelsior, and can use widths less than 2", but not less than 3/4", in plain, moistureproof and colours.

Would you be so good as to quote us on this material, which we presume might be classed as scrap.

Again thanking you for your courtesy and attention, we are.

Yours very truly,
HMS ASSOCIATES,

McL/s (sgd) W. N. McLennan.

M 3462

Defendant's Exhibit No. 833

January 5, 1948

FILE
JAN 5 1948
E. A. WIGHT

W M & ASSOCIATES
47 Ossington Ave.
Toronto 3, Ont.

Attention: Mr. W. M. McLennan

Dear Mr. McLennan:

In reply to your letter of December 27, we are glad to offer you the following reject roll stock, subject, of course, to prior sale:-

No. 300 MST	- 2" - 2-11/16" wide	- 9800 lbs.	- Price $.20 per lb.
No. 300 PT	- 3/4" - 1-7/8" wide	- 2100 lbs.	- Price $.075 per lb.
No. 300 PT	- 2" - 3-1/2" wide	- 1800 lbs.	- Price $.20 per lb.

While there is some stock in the heavier No. 450 and No. 600 gauge available, we have assumed that for excelsior you would prefer the No. 300 thickness and have confined our offer to this weight. No colored reject stock is available.

The above Cellophane is at our Clinton, Iowa plant and prices quoted are f.o.b. plant. Terms are net 30 days - no discount. It is not classified as waste and carries the 3rd Class rail freight rate.

Your continued interest is appreciated and we will be glad to hear from you if we can be of further service.

Cordially yours,

E. A. Wight, Asst. Manager
INDIRECT SALES

EAW/ms

M 3461

Defendant's Exhibit No. 834

VR please file with Iraq order

DIRECTORATE GENERAL
DATE ASSOCIATION
BAGHDAD

TELEPHONE No. 4963 / 4943

Telegraphic Address: TAMRA Baghdad

المديرية جمعية التمور العامة
بغداد

تلفون ٤٩٥٣ / ٤٨٤٣

العنوان البرقي : تمرة بغداد

Ref. No. 496
Date: 9/5/1948

العدد
التاريخ /

Messrs. E.I. Du Pont De Nemours & Company,
Empire State Building,
New York 1.N.Y., U.S.A.

حضرات السادة شركة إي . آي . دوبون
دي نيمورس المحترمين ،
نيويورك .

Dear Sirs,

In continuation of our cable dated 6th instant, and your reply of 7th instant, copies attached for confirmation.

تحية واحتراما ،
لاحقا ببرقيتنا المؤرخة ٦ مايس سنة ١٩٤٨ وجوابكم المؤرخ ٧ مايس المرفقة صورتهما طيا للتأييد

We have the pleasure to communicate to you our satisfaction with your cellophane paper sample and our decision to accept your quotations and to request you to supply us with a trial order as specified below:-

يسرنا أن نعلمكم بأننا وجدنا أنموذجكم من ورق السيلوفين ملائم فقررنا قبول عطائكم وأن نطلب اليكم تجهيزنا بطلبية تجريبية منه حسب المواصفات التالية :-

"Two tons of moisture proof crystal clear transparent cellophane paper type 300 M.T., size 40 x 44 inches at the rate of 0.606 (Dollars Nil point six hundred and six per lbs. C.I.F. Basrah packed 'Director General, Date Association, Baghdad, Iraq.

- عشرة أطنان من ورق السيلوفين الصافي عازل الرطوبة نوع أم . تي . ٣٠٠ حجم ٤٠ × ٤٤ انج بسعر ٦٠٦ و٠ دولار لكل ليبرة سيف بصرة مغلفة بصناديق للتصدير ومعلمة (مدير جمعية التمور العام ، بغداد ، العراق) .

Please intimate your confirmation and agreement to supply this trial order and arrange to ship this consignment within sixty days from the date of receipt of this order and submit the shipping documents, invoices and Insurance Policy in our favour to enable us to settle your account through any bank you nominate.

نرجو اشعارنا بتأييدكم وموافقتكم على تجهيز هذه الطلبية التجريبية واتخاذ التدابير اللازمة لشحن الارسالية الى البصرة بأسرع وقت ممكن وتقديم أوراق الشحن والقوائم وبوليصة التأمين بأسمنا ليتسنى لنا تسديد حسابكم الى المصرف الذي ترغبون دفعه اليه .

Yours faithfully,

المخلص

مدير جمعية التمور العام .

Director General,
Date Association.

M 3202

Fn. 61

Copy to:-

The Ministry of Economics, reference their letter No.6039 dated 8/5/48, for information.

" " The Royal Iraqi Embassy, Washington D.C., for information and to please render the possible assistance to the Company in their endeavour to obtain American Export License if needed.

" " The Iraqi Consulate General, New York, for information.

صورة منه الى :-

وزارة الاقتصاد - بالاشارة الى كتابها المرقم ٦٠٣٩ والمؤرخ في ٨/٥/١٩٤٨ للتفضل بالاطلاع.

السفارة الملكية العراقية في واشنطن - للتفضل بالاطلاع ومساعدة الشركة في الحصول على اجازة تصدير امريكية لهذه الارسالة اذا امكنت حاجتها اليها.

القنصلية الملكية العراقية العامة في نيويورك - للاطلاع.

M3202

FN. 61

Defendant's Exhibit No. 835

Cellophane
SX 5/20/48

E. I. duPONT de NEMOURS & COMPANY
INCORPORATED

DUPONT

Cellophane Division
MANUFACTURERS OF CELLULOSE FILM

SOLD TO DIRECTOR GENERAL
DATE ASSCIATION
BAGHDAD
IRAQ

SHIPPED TO

6/21/48

B/L NO	SHIPPED	VIA	TERMS		INVOICE NO
10444	6/21/48	BROOKS PREPAID	S/D L/C	XXXXXXXX	CXR-18493
C CODE	TRADE	SHIPPED FROM	F O B	CUST ORDER	OUR ORDER
	813	AMPTHILL, VA.	CIF BASRAH	496	CR 94796

ROLLS ARE PRICED PER LB. SHEETS ARE PRICED PER M SQ. IN. NO CLAIMS ALLOWED IF MERCHANDISE HAS BEEN TREATED OR PROCESSED IN ANY MANNER TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	NUMBER	DESCRIPTION OF CELLULOSE FILM OR CELLULOSE ACETATE FILM	SIZE	POUNDS OR M SQ IN	PRICE	AMOUNT
POUNDS					POUNDS	PER LB.	
22,400	265,000	300	MT	40 X 44"	22364.9	.606	13553.13
267,000	SHTS						
	PREPAID TRANS.CHGS. ON 27778# AT .67 CWT - XX 186.11						
	COMB. GR. WT. 27778# ON B/L 10444						
NOTE:	(TO PLANT) DON'T SHIP IN EXCESS OF 22,400#.						

PLEASE SEND ALL REMITTANCES TO E. I. duPONT de NEMOURS & COMPANY TREASURER'S OFFICE, WILMINGTON, DELAWARE INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

FOR INFORMATION OF SHIPPING PLANTS ONLY

DATE	TERMS	SHIP VIA	FREIGHT EQUAL	SHIPMENT REQUIRED
5/21	S/D L/C	PPD.		6/16 W

INSTRUCTIONS

USUAL BILL & HOLD INSTRUCTIONS
PACK IN XXXXX BOXES.
No remarks Cellophane JUNE PROJECT-22,400#
USE DOMESTIC LABELS
WT IN LBS
FINAL DEST. IRAQ
22400# 94796

STOCK DISBURSEMENTS

D G DATE
ASSN.
BAGHDAD
VIA BASRAH
#496-1/UP

300-S-MT-XX 31 22364.9#-13553.13

Fn. 61 M 3201

Defendant's Exhibit No. 836

IRMA FABRIKERNE

AKTIESELSKAB

TELEGRAM-ADR COPER IRMA
vh

RAVNSBORGGADE 12
KØBENHAVN N
COPENHAGEN N

TELEFON CENTRAL 255

19th May, 1948.

E. I. du Pont de Nemours & Company, Inc.,
Empire State Building,
New York 1, N.Y.
Cellulose Films, Seals and Sponges Export Section.
Gentlemen,

Many thanks for your kind letter of 12th May with interesting samples of your moistureproof cellulose film for the packaging of food products.

Unfortunately, we in this short-of-Dollars-country will not be allowed to buy cellophane otherwise than against Sterling at present, and even from Great Britain the import of cellophane is severely restricted.

We shall be pleased to contact you as soon as an opportunity to obtain an import license for the United States comes to us.

Sincerely yours,

IRMA FOOD FACTORIES LTD.

M 3292

FN. 8

Defendant's Exhibit No. 837

EXTRACT FROM MONTHLY REPORT-SEPTEMBER 1948

CC: R. R. SMITH - FILE 3370a
W. J. HARTE
E. C. LAKE - L. B. STEELE
H. P. SETTER
W. G. HUNTER - A. F. WENDLER

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE

October 5th, 1948.

CELLOPHANE DIVISION

TO: J. E. DEAN - A. KUNSMAN

FROM: C. F. BROWN

Subject: MONTHLY REPORT - SEPTEMBER 1948

EXPORT

There is no improvement in the restricted exchange permit situation in our major markets. In addition, while interest is being expressed in obtaining our product by European and Far Eastern countries, orders are not obtained due to shortage of dollars, or competition from B.C.L., or because of import restrictions outside the Sterling area.

M 3356

Defendant's Exhibit No. 838

PAPETERIES

BRUXELLES October, 29th, 1948.

G.D. E.I. du Pont de Nemours & C°
Empire State Building,
New York.

Dear Sirs,

This refers to your letter of October 4,1948, and to ours of October 26,1948.

Will you kindly ship at your earliest convenience, 10.000 sheets M.S.T. Cellulose film 100x100 C/ meters. as per your pro forma invoice dated 10/5/48. invoice and documents to be sent to our bankers:

Kredietbank,
Agence du centre
Rue des Poissoniers
BRUSSELS.

Will you please make offer and join samples for cellulose film 300 P.T. and 300 P.C. colour approximetely as per enclosed sample: "Pink"

Awaiting the pleasure of your reply, we remain, Dear Sirs,

Yours very truly,

G. DE WULF.

M 3118

FN. 21

NOUVELLE ADRESSE
52, rue de la Limite, 52
Tel.: 17.12.25
BRUXELLES

6, RUE DE LA LINIÈRE BRUXELLES TEL. 17.12.25
C.C.P. 5566.83 Adr. Télég. VENCEDORPA BRUXELLES
BANQUIERS - BANQUE DE COMMERCE
KREDIETBANK (Agence Bruxelles Centre)
BANQUE DE BRUXELLES Siège Social

Defendant's Exhibit No. 839

November 5, 1948

AIR MAIL
Papeteries Vencedor,
52, Rue de la Limite 52,
Brussels, Belgium.

Attention: Mr. G. De Wulf

Gentlemen:

Thanks very much for your letter of October 29th for the two cases of 300 MST film pertaining to our Pro-Forma invoice of October 5, 1948.

Our understanding is that you wish the material shipped to order on a protected sight draft with collection to be made through Kredietbank, Agence du centre, Rue des Poissonier2. Brussels.

Should this understanding not be correct, please submit further directions.

Our position with respect to supplying the non-moistureproof film is decidedly inferior. We manufacture but a limited amount of the film and our entire production is allocated far ahead.

Our specialty is the manufacture of moistureproof film such as you have just ordered. Along with the more standard moistureproof items, we have many specialties.

We have separate films for tobacco, for baked goods, for fresh produce, for frozen foods, for fresh meats, for processed meats, for a few other uses and, of course, for general use - particularly on dry products. This latter type we are sending you.

Inasmuch a- cellulose film is already made in Belgium, there would seem to be no particular point to our trying to develop sales even though we had the film to offer.

The plain transparent market would seem to hold no future in your country for us or for any foreign producer and we are quite sure you will agree with us after further reflection that our mutual interests would be best served by confining your efforts to the development of moistureproof sales in which we are in a pre-eminent position.

We can supply you with moistureproof film in colors like the samples

FN. 21 M. 3119

concluded

enclosed and would be happy to supply you with them should the use you have in mind require a wrapper that will conserve the freshness of the product so enclosed.

Very truly yours,

G. H. Andrews,
Manager - Export Sales.

C

Enclosure - 1 Sheet each, 12"x16", 300 MSQ Amber, Tango, Red. Dark Green and Dark Blue

FILE COPY

M3114

Defendant's Exhibit No. 840

E. I. duPONT de NEMOURS & COMPANY
INCORPORATED

Cellophane Division

SX 11/11/48

SOLD TO
PAPETERIES VENCEDOR
52, RUE DE LA LIMITE 52,
BRUSSELS, BELGUUM

SHIPPED TO

FAS A OR G PORT

	B/L NO.	SHIPPED	VIA	OUR PLANT	DATE INVOICE
	81133	3/10	CARST.C/O MID-STATES	XXXXXX	3/10/49 CXC-18968
TRADE 726	-	SHIPPED FROM CLINTON, IOWA	TERMS S/D D/P	CUST ORDER LTR.10/24/48	OUR ORDER CC-3551

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ IN

TERMS FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	DESCRIPTION	SIZE	POUNDS OR M SQ IN	PRICE	AMOUNT
	SHEETS			SQ.MTRS.	SQ.MTR.	
10,000		300 MST-51	100 X 100 C/M	10000	.0434	434.00
				BROKERAGE	5.00	

→ PLEASE SEND ALL REMITTANCES TO E. I. duPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY

ORDER 3/2/49 SHIP PPD. (FOR INFORMATION OF SHIPPING PLANT ONLY) SHIPMENT REQUIRED 3/11-1 XXXXXX

INSTRUCTIONS
USUAL BILL & HOLD INSTRUCTIONS
PACK IN CASES XXXXX

Defendant's Exhibit No. 842

SOCIÉTÉ ANONYME CELLPACK

CABLES
CELLPACK WOHLENAARGAU
TELEPHONE 81 C 69
CODES A.B.C. 5th EDITION IMPR.
A.B.C. 6th EDITION
BENTLEY'S

CELLPACK

WOHLEN, December 14th 1948.
AARGAU (SWITZERLAND)
MD/FK

E.I. DU PONT DE NEMOURS & CO.INC.
Empire State Building
New York 1, N.Y.

Gentlemen,

We have received your order confirmations for the 3 x 10'000 sheets MST 300 as well as for the 1'000 kilos MST 300/53.

According to your letter of December 9th these MST qualities can be shipped very promptly, and we would therefore kindly request you to let us have these first samples absolutely by return. The sooner we get them here, the sooner we can start our work with the Du Pont quality.

After having spoken to different people, we think that your LST quality can become very important for all the people who used PT up to now, but of course we have to submit samples to be tried out.

Hoping to get your respective invoices by return, we are

Yours very truly
S.A.CELLPACK

M 3211

Defendant's Exhibit No. 843

DUPONT

E. I. duPONT de NEMOURS & COMPANY
INCORPORATED

Cellophane Division

SX 12/3/48

SOLD TO

SHIPPED TO

SOCIETE ANONYME CELLPACK
WOHLEN, AARGAU
SWITZERLAND

FAS A OR G PORT

	B/L NO.	SHIPPED	VIA	F.O.B.	DATE	INVOICE NO.
	77218	1/6	CARST.C/O MID-STATES	XXXXXX	12/29/48	CXC-19028

TRADE		SHIPPED FROM	TERMS	CUST ORDER	OUR ORDER
912	-	CLINTON, IOWA	CLEAN S/D	138	CC-96548

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ. IN.

TERMS FROM DATE OF INVOICE
NOT CONTINGENT UPON DELIVERY

	DESCRIPTION	SIZE	POUNDS OR SQ.MTRS.	PER SQ.MTR.	AMOUNT
154,877 *	300 LST	100 C/M X STOCK WIDTH	XXXXXX	.0465	
549			11700.		544.05
257					
155,683 *	15				
78					
1556.05	34	1548.77			
	15	5.49			LESS 10%
		2.57			54.41
		1556.83			
		.78			489.64
		1556.05			

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE. INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE 12/6/48 SHIP VIA PPD. (FOR INFORMATION OF SHIPPING PLANT ONLY) SHIPMENT REQUIRED 12/30 W

INSTRUCTIONS
USUAL BILL & HOLD INSTRUCTIONS
PACK IN CASES

890# EX-QUOTA

RAT.CHGS. ON 1152# [illegible] @2.15 24.77

STOCK DISBURSEMENTS
C P
WOHLEN
VIA ANTWERP
#1/UP

300-S-LST 945.7 XX XXXXX 489.64

FINAL DEST. SWITZERLAND

Ex. 42

M 3213

7007

Defendant's Exhibit No. 844

Messrs.
E.I. du Pont de Nemour & Co.
Empire State bldg.
New York 1, N.Y.

ITALCONFECTIONERY, INC. N.1160/EXIM 2- New York, April 25th 1949

Att: Mr. G.H. Andrews
Manager Export Sales.

Dear Mr. Andrews:

With reference to our previous letter and to your reply of April 21st, while we thank you for the informations and quotation given us, we have herewith the pleasure to confer you an order for the following:

Kilos 8000 type 300 MST film in rolls 20" to 24" half and half packaged in tubular containers for export @ $ 1.122 per kilo FAS, N.Y, and

Kilos 10000 type 300 PT film in rolls 20" to 24" half and half packaged in tubular containers for export @ $ 1.034 per kilo FAS, N.Y. to be marked and invoiced for immediate shipment to:

MOTTA S.p.A.
Viale Corsica 21
Milano, Italy.

through our Brokers Messrs. Gondrand Bros., Inc. 33 Broadway, New York, N.Y. who will be instructed by us to secure export licence, therefore we are asking you a pro-forma invoice for the amount ordered.
Brokerage charges, insurance and freight will be billed to you separately, payment will be made in one with your invoice by draft at sight against documents at the Irving Trust Co. N.Y.

We thank you in advance for your prompt attention in remitting us the pro-forma invoice, we beg to remain.

Yours very truly,

* 4 copies M 3108

220 West 42nd Street — New York City 18, N. Y.
Telephone LAckawanna 4-7238 — Cable Address MOTTAPANAC

FN. 27

Defendant's Exhibit No. 845

E. I. duPONT de NEMOURS & COMPANY
INCORPORATED
Cellophane Division

MN 5/18/49

SOLD TO
MOTTA S. P. A.
VIALE CORSICA 21
MILANO, ITALY

SHIPPED TO

FAS NEW YORK

	ORDER NO.	SHIPPED	VIA	F.O.B.	DATE	INVOICE NO.
	86761	6/10	CARST.C/O MID-STATES	OUR PLANT	6/1/49	CXC-19599
TRADE		SHIPPED FROM	TERMS		CUST. ORDER	OUR ORDER
818	-	CLINTON, IOWA	S/D L/C		N.1160/ EXIM-8	OC-9540

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ. IN.

TERMS FROM DATE OF INVOICE. NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	DESCRIPTION		SIZE	POUNDS OR M SQ. IN.	PRICE	AMOUNT
*KILOS					KILOS	PER KILO	
71-2000-	71	300	MST-51	20"	1963	/.50	
71-2000	71	300	MST-53	20"	1899.26		
60-2000	60	300	MST-51	24"	2002.96		.5
60-2000	60	300	MST-53	24"	1977.03		.5
					2393.24	1.122	8799.50
89-2500	84	300	P.T.-62	20"			.57
89-2500	67	300	P.T.-62	24"	2267.16		
						1.034	4818.85
*SUBJECT 5% D/R							
EXPORT PRINTING					12503.82	.15	13618.85
							.42

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE	SHIP VIA	(FOR INFORMATION OF SHIPPING PLANT ONLY)	SHIPMENT REQUIRED
5/23/49	PPD		BILL & HOLD 6/1

INSTRUCTIONS

MARKS
MOTTA
MILANO VIA
GENOA
#1/UP

FRT.CHGS ON 30326# @1.25 $379.08

JUNE QUOTA 28600#

PACK IN TUBES
WHEN SHIPMENT IS
MADE PLS SUPPLY
ORIG. & 3 COPIES
INLAND B/L

FINAL DEST: ITALY FN. >7 M 3111

STOCK DISBURSEMENTS

300-R-MST-51	8744.4	4450.41
300-R-MST-53	8545.6	4349.16
300-R-PT-62	10274.4	4818.85

Defendant's Exhibit No. 846

N 12203-8

DUPONT

Cellophane Division

E. I. duPONT de NEMOURS & COMPANY

INCORPORATED

M 5/18/49

SOLD TO

MOTTA S. P. A.
VIALE CORSICA 21
MILANO, ITALY

SHIPPED TO

FAS NEW YORK

	B/L NO.	SHIPPED	VIA	F.O.B.	DATE	INVOICE NO.
	8255	6/16/49	BROOKS TRANS- PREPAID	OUR PLANT	6/16/49 [redacted]	CXR-19600

TRADE		SHIPPED FROM	TERMS	CUST. ORDER	OUR ORDER
818	-	AMPTHILL, VA.	S/D L/C	N.1160/ EXIM-2	CR 11871

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ IN

TERMS FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED *KILOS	ROLLS OR SHEETS	DESCRIPTION	SIZE	POUNDS OR M SQ. IN. KILOS	PRICE PER KILO	AMOUNT
2500	88	300 PT	20"	2435.04		
2500	77	300 PT	24"	2547.57		
[redacted]				4982.61	1.034	5152.02

*SUBJECT 5% - OR -

EXPORT PRINTING

5510# 92-R PREPAID TRANS CHGS ON 12020# AT 1.09 CWT- 131.02
COMBINED GR WT 12020# ON B/L 8255

5510# 77-R

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE. INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE 5/23 SHIP VIA PPD (FOR INFORMATION OF SHIPPING PLANT ONLY) SHIPMENT REQUIRED BILL & HOLD 6/1

MARKS
MOTTA
MILANO VIA
GENOA
#506/UP

INSTRUCTIONS
9 1/2" D.D.
JUNE QUOTA 11000#
PACK IN TUBES
USE PLAIN UNPRINTED LABELS
WHEN SHIPMENT IS MADE
PLS SUPPLY ORIG. & 3
COPIES INLAND B/L

STOCK DISBURSEMENTS
300-R-PT 10983.5#-5152.02

WT. IN LBS & KILOS

FINAL DEST: ITALY 11020# 11020#

11871 Fu. 27

M 3112

552

Defendant's Exhibit No: 847

SEAMAN AND SEAMAN
122 EAST 42ND STREET
NEW YORK 17, N.Y.
LEXINGTON 2-1318

CABLE ADDRESS
SEAMANPULP
NEWYORK

May 19, 1949

E. I. du Pont de Nemours & Company, Inc.
Empire State Building
New York 1, New York

Attention of Mr. G. H. Andrews, Manager
Export Sales

Dear Mr. Andrews: Your Pro-Forma Invoice PFX-159
Our Order No. 023486

Enclosed please find our order, in duplicate, for approximately five (5) tons of cellophane.

If possible, we would like to have this order sail on the "Welles City" scheduled to load in New York around June 10. For shipping instructions please contact our forwarding agents -

Judson-Sheldon Division
National Carloading Corp.
19 Rector Street
New York, N. Y.
(Mr. E. H. Luhmann)

We would appreciate receiving your invoice at least several days before the shipment is to arrive in New York in order to clear the shipment through customs. The packages should be marked -

Order No. 023486
Avonmouth, England
No. 1 and up

We wish to thank you for making this cellophane available to us.

Very truly yours,

S. L. Seaman

Stewart L. Seaman

M 3103

FM. 32

Defendant's Exhibit No. 848

DUPONT

Cellophane Division

E. I. duPONT de NEMOURS & COMPANY

INCORPORATED

MM 5/18/49

062640

SOLD TO
SEAMAN & SEAMAN
122 EAST 42ND STREET
NEW YORK, NEW YORK.

SHIPPED TO
SEAMAN AND SEAMAN
C/OF BRISTOL CITY LINE
PIER 9
HOBOKEN N J
FAS NEW YORK

	B/L NO.	SHIPPED	VIA	F.O.B.	DATE	INVOICE NO.
	8246	6/3/49	S S PPD	OUR PLANT	5/27/49	CXO-19598

TRADE		SHIPPED FROM	TERMS	CUST. ORDER	OUR ORDER
765	-	OLD HICKORY, TENN.	NET 30 DAYS	PHONED	C062640

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ. IN.

TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	DESCRIPTION	SIZE	POUNDS OR M SQ. IN.	PRICE	AMOUNT
POUNDS		GROSS WT 1274# FRT RATE 2.00		POUNDS	PER LB.	
1120	26	450 P.T.	15-1/4"	1158.1	.47	XXXXXX XXXXXX
24 R		DEL CHG .30				544.31
				FRT FROM OH		26.50
				DELY CHG		3.82
EXPORT	PRINTING					

PLEASE SEND ALL REMITTANCES TO E. I. duPONT de NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE. INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.

DATE 5/20 SHIP VIA PPD (FOR INFORMATION OF SHIPPING PLANT ONLY)

SHIPMENT REQUIRED BILL & HOLD 6/3

INSTRUCTIONS

JUNE QUOTA [redacted] 1120

MARKS:
WILL ADVISE
ORDER NO. 023486
AVONMOUTH ENGLAND
#1/UP

PACK IN TUBES.

FINAL DEST: ENGLAND

ROCK DISBURSEMENTS

544.31

450R PT 1158.1# XXXXXXX

REF 01 8305

FN. 32 M 3104

554

Defendant's Exhibit No. 849

R-12203-E

DUPONT

Cellophane Division

E. I. duPONT de NEMOURS & COMPANY

INCORPORATED

MM 5/18/49.

SOLD TO

SEAMAN & SEAMAN
122 EAST 42ND STREET
NEW YORK, NEW YORK

SHIPPED TO

FAS NEW YORK.

	F/L NO.	SHIPPED	VIA	F.O.B.	DATE	INVOICE NO.
	7696	6/6/49	BROOKS PREPAID	OUR PLANT	6/6/49	CXR-19597

TRADE		SHIPPED FROM	TERMS	CUST. ORDER	OUR ORDER
765	-	AMPTHILL, VA.	NET 30 DAYS	PHONED	CR 11815

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ. IN

TERMS FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED POUNDS	ROLLS OR SHEETS	DESCRIPTION	SIZE	POUNDS OR M SQ. IN. POUNDS	PRICE PER LB.	AMOUNT
51-R 2240	49	300 14-5/8"	P.T.	2207.8		
18-R 1120	18	300 20-3/4"	P.T.	1147.4		
16-R 1120	15	300 24"	P.T.	1128.0		
16-R 1120	15	300 23"	P.T. 27653	1084.9		
				5568.1	.47	2617.01
41-R 2240	41	300 18"	M.S.T.-54	2305.5		
17-R 1120	17	300 21-1/2"	M.S.T.-51	1076.5		
				3382.0	.51	1724.82
1120 17 R	17	300 21-1/2	M.T.-35	[illegible]	.50	549.45
				1098.9		
	PREPAID TRANS.CHGS. ON 10979# AT 1.01 CWT -				110.89	4891.28
EXPORT	PRINTING	COMB. GR. WT. 10979# ON B/L 7696				

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY

DATE	SHIP VIA (FOR INFORMATION OF SHIPPING PLANT ONLY)	SHIPMENT REQUIRED
5/19	PPD	BILL & HOLD 6/3

INSTRUCTIONS

JUNE QUOTA 10080#

MARKS: 9 1/2" O.D.
XXXXXXXXXXX
ORD.NO 023486
AVONMOUTH ENGLAND
#51/UP

9 1/2" O.D.

PACK IN TUBES

FINAL DESTINATION: ENGLAND

USE PLAIN UNPRINTED LABELS

STOCK DISBURSEMENTS

5600#	300-R-PT	5568.1#-2617.01
2240#	300-R-MST-54	2305.5#-1175.80
1120#	300-R-MST-51	1076.5#- 549.02
1120#	300-R-MT-35	1098.9#-549.45

WT IN LBS

11815 FR. 32 M 3105

553

Defendant's Exhibit No. 830

MANUFACTURE DE TABACS ET CIGARETTES

HEINTZ VAN LANDEWYCK S.A. R.L.

ADRESSE TELEGRAPHIQUE
TABACS LUXEMBOURG

LUXEMBOURG le 29th August 1949

W/K

E. I. Du PONT de NEMOURS & Company
Empire State Building
c/o M. G.H. ANDREWS

New York 1
N.Y.

W/K

Gentlemen,

We herewith beg to acknowledge receipt of your cable reading as follows:

"Relet 8/22 Price either quantity dlrs. 1.122 per kilo fas Newyork charges to Antwerp approximately five percent Delivery prompt Schedule B 4869.oo"

and kindly request you to supply at the above conditions, for immediate delivery,

abt. 2.000 kg 300 MST transparent cellulose film

on rolls 4-1/16" wide, 3" standard core, 9 1/2" O.D., as already supplied by you against order CXR 18265 of April 7th, 1948. Pleas send at once a pro-forma invoice in quadruplicate, covering the material and the approximate charges. Shipment will have to take place to Tabak & Melk Natie, 66, rue Van den Werve, Antwerp; shipping documents will have to be made out in their name and sent directly to their address. As soon as all particulars will be to hand, we shall apply for the irrevocable letter of credit. We also should feel obliged if you would cable us in due time the name of the steamer as well as date of departure as we want to cover the insurance on our side.

Looking forward to your confirmation, we beg to remain, dear Sirs,

Very truly yours,

Manufacture de Tabacs
HEINTZ VAN LANDEWYCK
S.A.R.L.

M 3089

Defendant's Exhibit No. 851

DU PONT

ARTICLES SHOWN ON THIS INVOICE WERE MADE IN THE U.S.A.

E. I. DU PONT DE NEMOURS AND COMPANY
INCORPORATED
350 FIFTH AVENUE
NEW YORK 1, N. Y.
U. S. A.

Los artículos comprados por este factura son productos de la industria de los E. E. U. U. de Norte América

Vendido a: HEINTZ VAN LANDENYCK S.A.R.L.
LUXEMBOURG, LE
LUXEMBOURG

SHIPPED TO / Embarcado a:

VIA / Por	TERMS OF PAYMENT / Condiciones de Pago	INV. DATE / Fecha Fact.	INV. NUMBER / Factura No.
	CONFIRMED IRREVOCABLE LETTER OF CREDIT THRU BANK AT NEW YORK	9/6/49	PFX-220

TRADE	SHIPPED FROM / Despachado Desde	COUNTRY	TERMS OF SHIPMENT / Condiciones de Despacho	CUST. ORDER NO. / No. Pedido del Cliente	OUR ORDER NO. / Nuestro Pedido No.
	BLACK ROCK, N.Y.		F.A.S. U.S. PORT OF EXPORT	LET. 8/29/49	

NO. OF PKGS. / No. de Bultos	QUANTITY / Cantidad	NUMBER / Número	DESCRIPTION / Descripción	SIZE / Tamaño	TOTAL QUANTITY / Cantidad Total	PRICE PER / precio por	U. S. DOLLARS
	APPROX. KILOS				APPROX. KILOS	KILO	APPROX.
541	2000	300	M.S.T.-58	4-1/16" WIDE	2000	1.122	2244.00
			CELLULOSE FILM				
					APPROX. CHARGES TO ANTWERP		75.00
							2319.00
	APPROX. WEIGHTS 4400 NET LBS. 4840 GROSS LBS.						

PRO-FORMA INVOICE

E. I. DU PONT DE NEMOURS & CO.
CELLULOSE FILM EXPORT SALES
E. & O. E.

SEE ATTACHED PACKING LISTS FOR WEIGHTS AND MEASUREMENTS.
PAYMENT OF THIS INVOICE IS NOT CONTINGENT UPON DELIVERY.
PLEASE SEND ALL REMITTANCES TO E. I. DU PONT DE NEMOURS AND COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE, U. S. A.
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY.
Para los pesos y dimensiones de los bultos favor de referirse a la lista de empaque adjunta.
El pago de esta factura no depende de la entrega.
Todas las remesas deben hacerse a la E. I. du Pont de Nemours and Company, Treasurer's Office, Wilmington, Delaware, E. U. A.
Toda factura no pagada a su vencimiento devengará interés.

11 3092

Fn. 47

Defendant's Exhibit No. 852

DUPONT

Cellophane Division

E. I. duPONT de NEMOURS & COMPANY

INCORPORATED

MM 10/11/49

SOLD TO

SHIPPED TO

MANUFACTURE DE TABACS ET CIGARETTES
HEINTZ VAN LANDEWYCK
LUXEMBOURG, LUX.

4400#
349

FAS A OR G PORT

	B/L NO.	SHIPPED	VIA	F.O.B.		INVOICE NO
	16494	11/7/49	BROOKS PREPAID	OUR PLANT	11/7/49	CXR-20192

TRADE		SHIPPED FROM	TERMS	CUST. ORDER	OUR ORDER
999	-	AMPTHILL, VA. -3	S/D L/C LESS 1%	LETS.9/29 & 10/1	CR 21092

ROLLS ARE PRICED PER LB
SHEETS ARE PRICED PER M SQ. IN.

TERMS: FROM DATE OF INVOICE NOT CONTINGENT UPON DELIVERY

QUANTITY ORDERED	ROLLS OR SHEETS	DESCRIPTION	SIZE	POUNDS OR M SQ. IN.	PRICE	AMOUNT
KILOS	ROLLS			KILOS	PER KILO	
2000	352	300 MST-58	4-1/16"	1983.07	1.122	2225.00
4410# 351-R						
EXPORT	PACKAGING					

PREPAID TRANS.CHGS. ON 4782# AT 1.17 CWT - 55.95

DO NOT OVERSHIP COMB GR. WT. 4782# ON B/L 16494

ECA PROC.AUTH. NO. 32/591/006002 IN 113 & SUB-AUTHOR. 405/182

BROKERAGE $5.00

PLEASE SEND ALL REMITTANCES TO E. I. DUPONT DE NEMOURS & COMPANY, TREASURER'S OFFICE, WILMINGTON, DELAWARE
INTEREST CHARGED ON ALL BILLS NOT PAID AT MATURITY

DATE	SHIP VIA (FOR INFORMATION OF SHIPPING PLANT ONLY)	SHIPMENT REQUIRED
10 /17	PPD	BILL & HOLD 11/3 W

MARKS
M DE TABACS
N V LANDEWYCK
LUXEMBOURG
VIA ANTWERP
#1/UP

INSTRUCTIONS

4400#
USE PLAIN UNPRINTED LABELS

USE ECA LABELS @394B
PACK IN TUBES
FINAL DEST: LUXEMBOURG
4410#

STOCK DISBURSEMENTS

300 B MST 58

4371.8#-2225.00

WTS. ON IN LBS & KILOS 21000 FN. 47 M 3095

Defendant's Exhibit No. 853

FREDRIK THRANE

CABLE ADDRESS: TRANFRED, OSLO – TELEPHONE 61 23 40 – CODE BENTLEY'S
MUNKEDAMSVEIEN 35 – OSLO, NORWAY

E.I. du Pont de Nemours & Company
Incorporated
Empire State Building
New York 1
New York

October 28, 1949

Attention Mr. G.H.Andrews

Dear Mr. Andrews:

Thank you very much for your kind letter of October 25.

When you have received no letters from us this is due to the fact that, frankly spoken, the only thing we have to report is that the situation is worse than ever as far as imports of Transparent Cellulose Film from The United States are concerned. The devaluation has caused that the American quotations, which previously were very competitive, no longer are able to compete. The dollar problem is still the same and the government does not allow imports of products from your country when the products may be bought in Europe even at higher prices.

For your information we can mention that we imported nice quantities of dyes from your country. Today, however, the government cuts down the imports and forces us to buy from European countries.

We very much regret the trouble we have caused you in the matter without being able to send you a single order. On the other hand, we have done what we could do under the present circumstances, having concentrated our efforts trying to sell your products to the more prosperous customers within the frozen fish industry, customers who might have some possibilities of obtaining import licenses as exporters. Even in these cases, however, we have had no success due to the above mentioned reasons.

Being very favourably impressed of your products and your cooperation we should very much appreciate if we sooner or later could be able to do business together. As the situation is today, however, we think it is not worth while trying to do business as it really is impossible. We will keep your firm in mind and should we see any opening some day you may rest assured that we will contact you.

With best regards,

Very truly yours,

FT:IS b

M 3159

Fredrik Thrane

Defendant's Exhibit No. 854

oy Ulko ab

TELEPHONES: 62767, 31653
39 239 38427, 64184
CABLE ADDRESS: ULKO, HELSINGFORS
CODES: BENTLEY'S, MEDGE, PRIVATE
CHEMICALS, METALS, RAWMATERIALS
FOR INDUSTRIES & TRADE

CHEMICAL'S RAWMATERIAL DEPT

OUR REF. Gn/MB

YOUR REF. _____

HELSINGFORS (Finland) December 3, 1949
S. ESPLANADGATAN 22 A

Messrs. E.I. du Pont de Nemours & Company Inc.
Cellulose Films, Seals and Sponges
Export Section
New York 1, N.Y.
Empire State Building.
U.S.A.

Attention: Chemical & Rawmaterial Dept.

Gentlemen.

TRANSPARENT CELLULOSE FILM

We are sorry a delay has occurred in replying to your letter of October 31, as our Mr. Gauffin has been travelling on the European continent. We thank you for your kind offer and are, of course, very interested in the product.

We are aware of the fact that it would be easy to find buyers of your transparent cellulose Film, but owing to the shortage of dollar exchange there would be great difficulties in getting the necessary import licenses. For the time being import licenses are granted for the most important American products, such as aniline dyes, which we continuously are ordering from your Organic Chemicals Department.

Arother fact is that transparent cellulose Films are also to be had in Europe.

Yours faithfully,
O/Y U L K O A/B
U. Gauffin

M 3168

Defendant's Exhibit No. 855

Cables "Lambertpro"
ACME CODE

YB1751/2.

LAMBERT PRODUCTS
PTY. LTD.

GENERAL MERCHANTS
IMPORTERS AND EXPORTERS
MELBOURNE. C.1
(AUST)

Registered Office:
"VICTORIA HOUSE"
44 Queen Street,
February 8th, 1950.

Messrs E.I. Du Pont De Nemour & Co.,
Cellulose Division,
Empire State Building,
NEW YORK 1, U.S.A.

Attention: Mr. G.H. Andrews.

Dear Mr. Andrews,

Thanks very much for your bulletin S.S.20 covering "Self Service Meats Manual".

All your bulletins, literature, etc., which we think should reach Film converters, merchants, and manufacturers, the originals or copies, are circularised by us to our clientele.

We find that your information, literature, etc., implements sales. Potential users immediately adopt the Film wrap when they are confident of the right type of Film, and how the Film should be used. So please continue forwarding your bulletins, literature, etc., that will be helpful in implementing sales of Cellulose Film. Our clientele and potential users are very appreciative of information obtained from Du Ponts, and the name of Du Ponts is regularly quoted in all packaging fields.

Our observations and surveys prove that at present the following packers are most interested to obtain the right type of Film, and how the Film should be used:

Red Meat Packers.	Pig Meat Packers.	All Offal Packers.
Poultry Packers.	Fish Packers.	Vegetable Growers.

These manufacturers and packers request the right type of Film for spot sales of their fresh merchandise over the counter. Also the right type of Film for them to wrap the same merchandise for spot freezing. When they sight from your literature the right type of Film to use, it is immediately adopted unconditionally, but the irony of the whole position is that on account of the present dollar situation and devaluation we cannot obtain the right type of Film from you. U.K. is now supplying a very good P.A.S.T. and P.A.S.T.-P.P.

We enclose original letter (which you can retain for your files) from Messrs Wrightsel ltd. which is self-explanatory of how your bulletins and literature are appreciated in this country. We request that you always forward us per Steamer mail six copies of each bulletin or literature, as our clients like to see your letter head. It gives them more confidence than our oral explanations,

M 3046

as Du Pont's Film is recognised in this country as the best Film in the World, plus the service that goes with it.

Yours sincerely,
LARKMAN PRODUCTS PTY. LIMITED.

G. E. DUNCAN.

EED:1.

M3046

Defendant's Exhibit No. 858

Copies to: G.H.Andrews, Du Pont Cellophane Co.
Foreign Relations Dept.

E. I. DU PONT DE NEMOURS & COMPANY,
INCORPORATED WITH LIMITED LIABILITY IN THE U.S.A.
WILMINGTON, DELAWARE, U.S.A.

London Office
BUSH HOUSE,
ALDWYCH, W.C.2

March 22nd, 1932

Mr. W. H. Farmer,
Du Pont Rayon Co.,
New York.

CELLOPHANE COMPETITORS - FELDMUEHLE PAPER CO.

Please refer to your letter of Feb. 10th asking us for information relative to the Feldmuehle Paper & Cellulose Company of Germany. We had occasion to discuss this subject with Mr. Wm. T. Daugherty, American Trade Commissioner in Berlin. He states that the three most important brands of cellophane type materials in Germany are "Cellophan", "Heliosell" and "Transparit", respectively, and all are made by the viscose process. The full name of the concern manufacturing Heliosell is Feldmuehle Papier & Zellstoff-werke A.G., of Stettin. They manufacture this product at their Odermuende plant and their capacity is given at 800,000 kilograms per year from their latest available annual statement.

Mr. Chase has been in touch with the French Cellophane people on this same subject and they advise that Heliosell is manufactured by the same process as that of Wolff & Company. Wolff & Co. recently sued the Feldmuehle Co. but have received an adverse judgment before the lower court. Mr. Chase further states that in January, 1931, he forwarded information regarding this company together with a booklet on Heliosell which contained rather clever advertising features. We are attaching a copy of this letter.

Mr. Chase further advises that the French Cellophane Company is securing samples of the cellophane for us, together with such information as they are able to develop. We will, of course, forward this on to you as soon as we receive it.

Mr. Chase has also secured a copy of Kalle's write up of competitive products which Mr. Todt sent to Mr. J. E. Hatt on Nov. 26, 1931. As this has an additional sheet covering America, and also a translation of a circular sent out by Kalle & Co. on Dec. 4, 1931 to their travellers and agents covering new information about competitive products, we are sending you a copy. Will you not circulate this to Mr. Hatt and Mr. Andrews.

Mr. Daugherty states that Langbein & Co. G.m.b.H., of Reslingen on-the-Neckar is the principal gelatine producer. The company markets "Pliaphan" (and "Reslinger Zelliglas"). Pliaphan is machine-made by a special process from gelatine with addition of certain chemicals to impart toughness, pliability and durability. It is reported as superior as a protective wrapping for better grade packings as a "window" with print transparency, to wrap certain food stuffs, silk rolls, rubber tape, etc. and recently even for cigars and other tobacco products.

ENCLOSURES
JKJ/EW

J.K.JENNEY

Defendant's Exhibit No. 859

Copy to Foreign Relations Dept., Wilmington 5172

E. I. DU PONT DE NEMOURS & COMPANY,
INCORPORATED WITH LIMITED LIABILITY IN THE U.S.A.
WILMINGTON, DELAWARE, U.S.A.

London Office:
BUSH HOUSE,
ALDWYCH, W.C.2.

Allophane Poland
Rayon Poland

November 9th, 1932.

R. M. Horsey,
Du Pont Rayon Co.,
New York.

TOMASZOW ARTIFICIAL SILK WORKS

With reference to your letter of September 2nd in which you asked us to secure a sample of transparent sheeting manufactured by the above company, Mr. Chase has managed to secure a sheet of "Tomophan" through the Comptoir, and we attach it herewith.

These sheets are sold at Zl. 0.45 less 5% for cash. There are 30 sheets per kilo, making the kilo price Zl.13.50 less 5% for cash, or Zl.12.75 per kilo net. (Zl.equals 11.2¢ making price equivalent to 65¢ per lb.)

It appears that the manufacture of "Tomophan" is increasing and that the Tomaszow Company is very satisfied with the results obtained.

Mr. Chase states that the Textra yarn manufactured by this company is a product which has been developed to compete with "Vistra" which is manufactured by the I.G. and has up to the present been imported from Germany into Poland. We have been promised a sample of this yarn and will send it along when it arrives.

J. K. JENNEY

M 3455

JKJ/EW
ENCLOSURE: 1 sheet "Tomophan"

16

Defendant's Exhibit No. 860

5178

FILE: I.G. RAYON
A.K.U.
CELLOPHANE - GERMANY

Copy to: Mr. J. E. Hatt
Mr. R. K. Horsey

August 7, 1924.

Letter No. 226.

LONDON OFFICE

We quote below two items from the "Chemical Age", July 21, 1924, on which we are sure the Rayon Company will be pleased to receive information, if you have not already forwarded it to them:

"In co-operation with the I. G. Farbenindustrie, the Bemberg concern is responsible for a new synthetic textile, likewise based upon the cuprammonium reaction, distinguished by high wet strength and good milling qualities. The current daily production is 2,000 to 3,000 kilos."

"Bemberg A.G. have announced the successful production of a cellulose film material by the cuprammonium process. It has already been resolved to erect a small-scale plant for the material which will be marketed under the brand name of Cuprophan."

FOREIGN RELATIONS DEPARTMENT
J. E. JENNEY, ASST. DIRECTOR

JEJ.fcr

M 3467

Defendant's Exhibit No. 861

CC: Mr. O. P. Bens - N.Y.
Mr. A. S. Allen - N.Y.
Mr. M. du Pont Lee - Bfld.
Mr. E. K. Gladding - "
Mr. H. O. Thayer - "

Buffalo, New York
March 11, 1935

P-19

Mr. J. E. Hatt, G.M.
"Cellophane" Department
New York Office

Subject: GERMAN BEMBERG CUPRAMMONIUM FILM (CUPRAPHANE)

I am enclosing a memorandum in connection with the German Bemberg light weight cellulose sheeting. This was one of the things that I saw over in Germany that looked rather interesting, and it occurred to me that if they get their manufacturing properly ironed out over in Germany, it would not be unlikely to find the American Bemberg Company perhaps going into this type of production at some time in the future. They have, of course, a rayon plant down in Tennessee which makes a solution from which this film could be very readily cast.

I am attaching to the copies of this letter small samples of the Cupraphane sheeting, and I am sending with Mr. Allen's copy a very interesting roll of Cupraphane slit to about 1/8 inch in width. This roll might be of very great interest to the electrical people for wire winding, and I believe it would be worth while for Mr. Allen to show you this sample.

The Bemberg Company sell this film for about the same price per unit area as Kalle film. Thus, they get about twice the price per pound.

The main thing that attracted me in connection with this light weight film was the remarkable strength that it possesses for the very small thickness in which it is manufactured. Furthermore, the film contains only a very few per cent of glycerol. I have seen no thin film from the viscose process that would appear to compare with this in strength properties.

PIONEERING RESEARCH DIVISION

W. H. Charch, Director

WHC:JC
VP

M 3363

Defendant's Exhibit No. 862

Buffalo, New York
March 11, 1935

MEMORANDUM

BEMBERG CUPRAMMONIUM FILM (CUPRAPHANE)

This is the newest of the transparent wrapping films in Germany, being now about two years old. It has taken some business away from Cellophane on articles lending themselves to a non-tension direct wrap where the ends of the Cellophane are twisted to secure the package. It lends itself to such uses due to its outstanding toughness and the thin gage in which it is manufactured. It has also found use in wire and cable wrapping where thinness and toughness are both essential. For this purpose, Bemberg slits it and offers it in slit rolls of about 1/8" width and about 8" diameter. Sample was obtained and shows excellent job of slitting and winding.

The film may be currently obtained in a gage of 13 gr./sq.m. and they claim they can also manufacture it in a gage of 8 gr./sq.m., but Kalle has not actually seen any of this thinner material. We (Du Pont) would consider 13 gr./sq.m. a very thin gage; indeed, this is what the electrical people in the United States have long asked for. This thin gage material is obtained by the "stretch spinning" method which Bemberg employs in their yarn process. Kalle think quite well of this Bemberg film, judging from their attitude during our discussion.

They (Kalle) have made some attempts, although not extensive, to duplicate Cupraphane by the viscose process without success. They were unable to get a film of less than 18 gr./sq.m., and with this thin film they had great slitting difficulty, whereas Bemberg slit successfully. I examined some small sheets of Cupraphane and am also of their conclusion, that this film possesses a sort of inherent toughness (Festigkeit) that we have not yet seen in viscose sheeting. It stands rough handling to a surprising degree and this in spite of the fact that it contains only about one-third of the glycerol of Cellophane. The Cupraphane is made from cotton linters which, no doubt, also contributes to its toughness.

"Cupraphane" commands a somewhat higher price than Cellophane per kilo, but not in inverse proportion to its unit weight. For a 12 - 13 gr./sq.m. film, they get 10-1/2 pfennig per square meter, or about 7-1/2 marks per kilo. For cut material in narrow widths they ask the same price. Kalle could only explain this by saying that for regular rolls and sheets the quoted price was not the real price.

There are a number of new patents filed and/or issued to Bemberg relating to films and their manufacture, as follows:

German Applications not yet granted	B 148,480
	B 151,180
	B 150,988
	B 148,436
	B 148,701

M 3163 A

WC:JC

Bemberg Cuprammonium
Film (Cupraphane)

March 11, 1938

English Patents 378,342
380,356

English Application 5,060 Feb. 19, 1932

CONCLUSION

This copper process film looks very interesting and would certain appear to have some unique uses if it were offered in the United States -- wire wrapping, non-tension wraps, light weight bags, etc. It would not be surprising to find uses for the moistureproof article, although Bemberg does not offer one in Germany. I believe we should do some work on the new Semi-Works casting machine to produce a small quantity of it and to study its properties in terms of American markets. Bemberg has rayon plants in the United States and it would not be at all surprising to find them entering the market for sheeting. Up to date, we have not produced an equivalent sheet from viscose. It may be that our present casting machines could spin a cuprammonium film, although special changes might be needed. This film should not be overlooked.

FILE COPY

WILLIAM HALE CHARCH

WHC:JC

Prepared in
Germany
January, 1938

M 3363 A

Defendant's Exhibit No. 973

cc to Messrs.
H. C. Haskell - Legal
B. M. May - Rayon
A. Kunsman - Rayon

DEVELOPMENT DEPARTMENT OCTOBER 25, 1948

675-L-B.

MEMORANDUM

TO: ~~E. K. GLADDING, DIRECTOR~~
~~R. E. FORD~~
~~H. H. EWING~~
IN TURN

FROM: J. L. FAHS

CELLOPHANE
OLIN INDUSTRIES, INC.

Mr. Fred Olsen, Director of Research and Development for Western Cartridge Company Division of Olin Industries, discussed cellophane with Mr. Ford and Mr. Fahs on October 22.

He said that, in the course of a general study of new activities, Olin Industries had been considering cellophane for about five years. They had made their own investigations of the market and the U. S. production, from which they had concluded that new capacity of about 30 million pounds a year should be considered. Based upon a preliminary plant layout, they had estimated that such a plant would cost about $16,500,000. Their interest was brought to a head by the recent receipt of reports that du Pont was willing to grant licenses and technical assistance to a new producer. Mr. Olsen was here to ascertain du Pont's position.

Mr. Olsen was given a copy of the "Preliminary Information" summary, which covered most of the points discussed. He was also told the fees expected: $800,000 for licenses and know-how, plus a normal contractor's fee for whatever engineering work du Pont is called upon to do.

Mr. Olsen referred to a Government technical report by Mr. Lloyd Leach on the manufacture of cellophane in Germany by the cuprammonium process, and inquired whether that process was apt to supersede the viscose process. He was told that, according to our best available information, the cuprammonium process was operated in Germany only for the production of a relatively small quantity of extra-thin film for specialty uses, and that there is no indication that the process would become important in the U. S.

M1331

Mr. Olsen inquired whether there was any reason why Olin Industries would not be acceptable to du Pont as a licensee for cellophane. He was told that no such reason was known, but he was reminded that the opportunity was under active study by others, and no assurance could be given that it would remain undiminished. Mr. Olsen said that the Olin Board would meet in about ten days, by which time he hoped to present a report and obtain official advice regarding their interest.

JLF

JLF/mr

Defendant's Exhibit No. 974

Draft 10/21/49

AGREEMENT made this 4TH day of NOVEMBER, 1949, at Wilmington, Delaware, by and between E. I. DU PONT DE NEMOURS AND COMPANY, a corporation organized and existing according to the laws of the State of Delaware and having a principal place of business at Wilmington, Delaware (hereinafter called DU PONT) and

Olin Industries, Inc. a corporation organized and existing according to the laws of the State of Delaware and having a place of business at East Alton, Illinois (hereinafter called LICENSEE):

W I T N E S S E T H:

WHEREAS, DU PONT is now engaged in and intends to continue in the commercial manufacture and marketing of cellophane, and possesses information relating to and is the owner of patents relating to cellophane; and

WHEREAS, LICENSEE is interested in obtaining from DU PONT and DU PONT is willing to grant to LICENSEE the rights hereinafter referred to relative to cellophane;

NOW, THEREFORE, in consideration of the premises and of the undertakings hereinafter set forth, it is agreed as follows:

I. DEFINITIONS

(a) The term "cellophane", wherever used herein, shall signify and be limited to flexible, non-fibrous regenerated cellulose film having a thickness not exceeding 0.002 inch and suitable for use as wrapping material although not limited to such use. The term "cellophane," as used herein, shall include (1) both coated and

M1339

uncoated film and (2) both moistureproof and non-moistureproof film, but shall not include articles having a tubular or hollow shape imparted during the process of their formation and adapted for use in such tubular or hollow shape.

(b) The term "cellophane manufacture", whenever used herein, shall, unless otherwise stated, include the production of alkali cellulose, the conversion of alkali cellulose into viscose, the utilization of viscose for the production of cellophane, the imparting of moistureproofness to cellophane, the recovery of solvent used in applying coatings to cellophane and the finishing of cellophane. It is understood and agreed that the term "cellophane manufacture" shall not, directly or indirectly include the production of any chemicals except alkali cellulose and cellulose xanthate and such other chemicals as are customarily produced by DU PONT within its cellophane plant for the manufacture of cellophane at the date of this agreement.

II. INFORMATION

(a) DU PONT shall, as and when required for the expeditious performance of this agreement, impart to LICENSEE all technical information and know-how relating to cellophane manufacture and used by DU PONT in its cellophane manufacturing operations at the date of this agreement; DU PONT shall impart to LICENSEE all additional technical information and know-how relating to cellophane manufacture which shall have been adopted by DU PONT in its cellophane manufacturing operations prior to the expiration of the period of four (4) years following the date of the completion of the construction of the initial cellophane manufacturing plant referred to hereinafter, together with the technical information and know-how possessed by DU PONT prior to the expiration of said period of four (4) years, which information, in the opinion of DU PONT, offers real commercial promise for cellophane manufacture; provided, however, that the

M1330

obligation of this paragraph shall not apply to information acquired by or developed by DU PONT at any time following six (6) years subsequent to the date of this agreement, provided, further, that this six (6) year period shall be extended by the total number of days during which the design or construction of the plant shall have been delayed or postponed by the operation of any force majeure.

(b) LICENSEE and DU PONT shall, at LICENSEE'S request, confer with respect to the technical information referred to in preceding Article II (a) in order that LICENSEE shall obtain all of said information which, in the judgment of DU PONT, may significantly affect cellophane and its process of manufacture.

(c) DU PONT shall also inform LICENSEE of the types of cellophane manufactured by DU PONT at the date of this agreement and the ratio of said types with respect to each other.

III. PLANT CONSTRUCTION AND OPERATION

LICENSEE hereby agrees to proceed, as expeditiously as possible following the date of this agreement, with the design, construction and operation of a plant for cellophane manufacture and with the marketing of cellophane produced in said plant. LICENSEE, in pursuance of this object, may request DU PONT to perform any or all of the following undertakings, in whole or in part, and DU PONT, if so requested agrees to perform at the expense and risk of LICENSEE the undertakings so requested.

(a) DU PONT shall assist LICENSEE in the selection of and acquisition of a plant site in accordance with DU PONT'S experience in selecting and acquiring plant sites for cellophane manufacture. LICENSEE shall have access to all data on cellophane plant site studies which have been compiled by DU PONT and shall receive the assistance of DU PONT in negotiating for the necessary utilities for such plant.

(b) DU PONT shall, in accordance with its standard engineering practice, provide LICENSEE with complete specifications and dravings of plant design, including equipment and facilities, for the construction of a plant for cellophane manufacture, and with respect to said design as well as with respect to the plant construction and operation referred to hereinafter, shall, in accordance with its experience and to the best of its ability, observe all applicable laws, whether local, state or national, pertaining to the prevention of nuisances such as fumes, stream pollution and the like.

(c) DU PONT shall prepare a detailed engineering estimate of the cost of buildings, equipment and facilities for such cellophane plant and submit same to LICENSEE.

(d) DU PONT shall upon LICENSEE'S request undertake construction of the cellophane manufacturing plant as soon as can conveniently be done after the date of this agreement and shall endeavor to complete said plant at as early a date as possible, with due regard for existing conditions.

(e) DU PONT shall procure materials, machinery and utilities required for the construction of the cellophane manufacturing plant.

(f) DU PONT, in accordance with its experience in the operation of cellophane manufacturing plants, shall assist LICENSEE in the hiring and training of such personnel as will be required for the initial operation of and maintenance of the cellophane manufacturing plant, and DU PONT shall also assist LICENSEE in setting up engineering, research, sales and administration organizations for said plant. This obligation of DU PONT shall not require transfer

of personnel from DU PONT'S organization except as DU PONT and LICENSEE mutually agree from time to time hereafter and except as such personnel shall consent to be transferred. It is understood and agreed that all personnel so hired or transferred shall be considered for all purposes as employees of LICENSEE. DU PONT'S obligation as to the training of personnel shall not continue beyond six (6) months after the start of commercial operation of the first cellophane casting machine at said plant.

(g) DU PONT shall assist in the placing of each machine of the cellophane manufacturing plant into commercial operation as soon as can reasonably be done under the then existing conditions, provided, however, that in the event delay is caused or requested by LICENSEE as to such commercial operation, DU PONT'S obligation with respect to the operation of said plant shall not continue beyond a period of six (6) months following the initial commercial operation of the first cellophane casting machine.

(h) In the event LICENSEE cannot procure, at reasonable cost from a source of supply other than DU PONT, equipment required for replacement of equipment made by DU PONT and installed in said cellophane manufacturing plants referred to in this Article, DU PONT agrees to fill LICENSEE'S orders for such equipment to the extent that DU PONT determines it can reasonably do so, within ten (10) years following the date of this agreement.

(i) DU PONT shall assist LICENSEE in initially locating and securing sources of supply for the raw materials required in cellophane manufacture.

(j) It is the intent of the parties that the cellophane manufacturing plant to be constructed in accordance with the foregoing

provisions (hereinafter referred to as "the first plant"), shall have a rated annual production capacity at 100% operation of approximately thirty-three million seven hundred thousand (33,700,000) pounds of cellophane, of a quality comparable to that being produced by DU PONT at the time of this agreement, when the types of cellophane produced and their ratios to each other are as set forth in Exhibit A. This rated capacity is recognized as the theoretical capacity of such a plant operating under ideal conditions, and DU PONT does not represent that this capacity can be attained in practice in the present state of the art of cellophane manufacture. It is understood and agreed that the first plant shall embody the minimum number of cellophane casting machines, not more than eight (8), which, in the judgment of DU PONT, will be capable of realizing the aforesaid intent. Said cellophane casting machines shall be of the most advanced design or designs operated by DU PONT at the date of this agreement or developed by DU PONT to a stage offering, in the judgment of DU PONT, superior commercial performance.

(k) In the event that within five (5) years from the date of this agreement, LICENSEE, by written notice to DU PONT, commits itself to the erection, at as early a date as is reasonably possible, of plant capacity for cellophane manufacture in addition to and having at least half the production capacity of the first plant, DU PONT agrees that, with respect to such additional plant capacity, it will upon request of LICENSEE extend its obligations as to the undertakings heretofore set forth in this Article III in connection with said first plant, insofar as said obligations refer to plant design and construction but not otherwise, to such additional plant capacity in the same way and to the same extent as if said additional plant capacity were specifically provided for at the date of this agreement. The obligations of DU PONT as provided for in this

paragraph shall not, however, extend beyond the construction of such number of additional casting machines and plant equipment auxiliary to said additional casting machines as are equivalent in production capacity to those embodied in said first plant. In such event, LICENSEE will extend its undertakings with respect to said first plant to such additional plant capacity in the same way, and to the same extent, as if said additional plant capacity were specifically provided for at the date of this agreement.

(l) It is agreed (1) that the plants to be erected by DU PONT for LICENSEE under the foregoing provisions of this agreement, the plant sites for said plants and the materials, machines and other property to be acquired in connection with the construction and operation of said plants shall be owned by LICENSEE, (2) that the undertakings and obligations of DU PONT provided for in this Article shall be performed for the account of and at the risk of LICENSEE and (3) that LICENSEE assumes full responsibility, both financial and otherwise, in connection with said provisions, with respect to any person, firm or corporation who is not a party to this agreement.

(m) It is estimated that, with respect to the said first plant:

(1) The design and construction work is estimated to cost Eighteen Million Dollars ($18,000,000) and to require twenty-seven (27) months for completion. Facilities for the production of steam and power are not included in this estimate.

(2) The training of LICENSEE'S employees, including management of the initial operation of said first plant, is estimated to cost One Hundred and Thirty-Five Thousand Dollars ($135,000.00), exclusive of wages, salaries, and expenses of LICENSEE'S employees, and to require twelve (12) months for completion.

Except as provided in Article VI, performance under this agreement shall in no way be affected or influenced by the aforesaid cost or time estimates and DU PONT assumes no liability in the event any or all of the said estimates prove to be incorrect.

IV. USE OF INFORMATION BY LICENSEE

LICENSEE shall be entitled to the unrestricted use and disposition of all technical information and know-how received from DU PONT hereunder, provided, however, that LICENSEE shall maintain confidential, for a period of ten (10) years after the receipt thereof, all such information and know-how except as the same has or shall become public through sources other than LICENSEE and except to the extent required in the normal course of LICENSEE'S commercial cellophane business. Nothing in this Article IV shall be construed to grant any right or license under any patent, inasmuch as the granting of patent licenses is provided for below.

V. PATENT LICENSES

(a) DU PONT hereby grants to LICENSEE non-exclusive, non-assignable licenses to manufacture, use and sell cellophane under each and every patent owned or controlled by DU PONT and issued on any patent application filed prior to the expiration of six (6) years after the date of this agreement, to the extent that DU PONT has the right to convey such licenses. The patent licenses provided for herein shall, unless earlier terminated on account of breach by LICENSEE, continue for the life of the licensed patents.

(b) No right or license, direct or indirect, express or implied, is granted under any patent except as provided for in this Article V with respect to the manufacture, use or sale of regenerated cellulose film.

VI. FINANCING AND ASSISTANCE BY LICENSEE

For the purpose of facilitating and expediting the completion of the design, construction and operation of the plants referred to herein, LICENSEE agrees as follows:

(a) LICENSEE shall arrange for and be entirely responsible at all times for the financing of the design, construction, operation and maintenance of the plants referred to herein and of the training of employees.

(b) Except as provided in the second sentence of this paragraph (b) all expenditures reasonably necessary for said plant design, construction and operation shall be subject to the approval or ratification of the LICENSEE. In the interest of preventing delay in the authorization of such expenditures, LICENSEE hereby authorizes and approves all expenditures required in the judgment of DU PONT during such design, construction and operation as are undertaken by DU PONT, up to the sum of Five Thousand Dollars ($5,000.00) for each such expenditure.

(c) LICENSEE agrees to set up such personnel as will be required, during such design, construction and operation, for the rapid approval of expenditures in order that the progress of said design, construction and operation will not be impeded.

[illegible] O - 55 - vol 8 - 12

(d) It is agreed that LICENSEE will reimburse DU PONT for all costs and expenses, computed according to DU PONT'S usual accounting practice, in the performance by DU PONT of the work hereunder, including, but not limited to (1) all labor, materials, equipment, supplies and services necessary for the benefit of the work, (2) wages and salaries of all DU PONT employees engaged in the work, (3) payments by DU PONT under the Social Security Act and any disbursements required by law which DU PONT may be required to pay on account of this agreement, (4) premiums on such bonds and insurance policies reasonably necessary for the protection of LICENSEE or DU PONT, (5) any losses not compensated by insurance, (6) extra compensation to employees, discontinuance wages and charges under welfare and other employee relations policies maintained by DU PONT insofar as such payments or charges are applicable to work under this agreement, and (7) general expenses of DU PONT incident to work under this agreement.

(e) LICENSEE will currently reimburse DU PONT for costs and expenses incurred in accordance with this agreement upon submission to and approval by LICENSEE of reasonable evidence of such costs and expenses.

(f) At any time and from time to time after the execution of this agreement, at the request of DU PONT and for the purpose of providing DU PONT with the working capital required for carrying out DU PONT'S obligations hereunder, LICENSEE shall advance to DU PONT, without payment of interest thereon by DU PONT, sums not to exceed thirty per cent (30%) of the estimated cost of work to be performed by DU PONT under this agreement as such estimated cost may be reasonably modified from time to time by DU PONT. It is agreed that whenever the aggregate of the advance payments outstanding under this agreement, together with funds received as reimbursement for the cost of the work by DU PONT shall exceed the total estimated cost of the work to be performed by DU PONT under this agreement, as said cost may be reasonably revised from time to time by DU PONT, any such excess shall be repaid immediately by DU PONT to LICENSEE.

(g) DU PONT agrees to keep records and books of account, showing the cost of all items of labor, materials, equipment, supplies, services and other expenditures of whatever nature for which reimbursement is authorized under the provisions of this agreement. The system of accounting to be employed by DU PONT shall be that customarily utilized by DU PONT in the regular conduct of its business.

VII. PAYMENTS BY LICENSEE

LICENSEE agrees to make the following payments to DU PONT:

(a) In consideration of the information and know-how to be given by DU PONT to LICENSEE under this agreement, LICENSEE shall pay to DU PONT on the date of this agreement the sum of Four Hundred Thousand Dollars ($400,000.00). LICENSEE shall additionally pay to

DU PONT a sum of Ten Thousand Dollars ($10,000.00) upon the date of initial commercial operation of each million (1,000,000) pounds per year of production capacity installed by or for LICENSEE, in addition to the capacity of said casting machines for the first plant up to but not beyond additional capacity equivalent to that of said casting machines for the first plant.

(b) In consideration of the patent licenses provided for herein, LICENSEE shall pay to DU PONT on the date of commercial operation of the first plant, or any portion thereof, an additional sum of One Hundred Thousand Dollars ($100,000.00).

(c) In consideration of the obligations assumed by DU PONT with respect to the design and construction of said first plant, LICENSEE agrees to pay to DU PONT upon completion of DU PONT'S obligations with respect to said plant, the following sums:

(1) For design and engineering of equipment, the sum of Two Hundred and Thirty-Five Thousand Dollars ($235,000.00);

(2) For design and engineering of buildings, the sum of Seventy-Five Thousand Dollars ($75,000.00);

(3) For construction of equipment, the sum of Seventy-Five Thousand Dollars ($75,000.00);

(4) For construction of buildings, the sum of Forty Thousand Dollars ($40,000.00);

(5) For installation of equipment, the sum of Seventy-Five Thousand Dollars ($75,000.00).

In consideration of the obligations assumed by DU PONT with respect to the design and construction of additional capacity as set forth herein, LICENSEE agrees to pay to DU PONT upon completion of DU PONT'S obligations four per cent (4%) of the estimated cost of such additional work, as agreed upon by both parties prior to the commencement thereof.

(d) All sums payable under this agreement by LICENSEE to DU PONT shall be paid to DU PONT at its Wilmington, Delaware Office in lawful United States currency.

(e) LICENSEE is free, under this agreement, to build plant capacity, with respect to the rights granted herein to LICENSEE for cellophane manufacture, to any extent which LICENSEE may wish in excess of the plants specifically discussed in this agreement. It is understood and agreed that such additional expansion shall require no payments to DU PONT in addition to those specifically provided for in this agreement.

VIII. TERMINATION

(a) DU PONT reserves the right to terminate this agreement, together with all rights and licenses granted hereunder by DU PONT to LICENSEE on thirty (30) days written notice to LICENSEE in the event that any of the stipulations or provisions of this agreement are not kept or performed by LICENSEE unless, within said thirty (30) day period, LICENSEE shall correct any such breach. Any termination in accordance with this paragraph shall not relieve LICENSEE from any payments due up to the date of termination or thereafter with respect to activities of DU PONT under this agreement which occurred on or before the date of such termination, including all payments provided in Article VII.

(b) LICENSEE reserves the right to terminate this agreement, together with all obligations accruing thereafter, on thirty (30) days written notice to DU PONT in the event that any of the stipulations or provisions of this agreement are not kept or performed by DU PONT unless, within said thirty (30) day period, DU PONT SHALL correct any such breach.

(c) A waiver of any one breach shall not be deemed a waiver of any subsequent breach.

(d) Any termination in accordance with the foregoing shall not be deemed a waiver of and shall be without prejudice to any other legal right or remedy.

IX. ARBITRATION

In the event that either party serves notice to the other of breach of any of the stipulations or provisions of this agreement, the party so notified may, within the thirty (30) day period following such notice, notify the other party that it desires to submit to arbitration the question as to whether a breach has occurred. The question of breach shall then be submitted to arbitration in accordance with the arbitration rules, then obtaining, of the American Arbitration Association. In the event the arbitrators determine that a breach has occurred, the party so breaching shall have thirty (30) days after the decision of the arbitrators in which to cure said breach. In the event the arbitrators held that no breach has occurred, or in the event that the breach is cured without submitting to arbitration, or in the event the breach is cured within the time limit set forth above, after the arbitrators have determined that a breach has been committed, this agreement shall continue as though no notice of breach had been given.

X. INFRINGEMENT

(a) DU PONT shall be under no obligation to institute a suit or prosecute infringers under any patent licensed herein, nor shall DU PONT in any way be responsible or liable to LICENSEE for failure to prosecute infringers. If DU PONT elects to prosecute any infringer, the conduct of such suit shall be entirely directed

by DU PONT and any recoveries therein shall belong exclusively to DU PONT.

(b) DU PONT agrees to assume any liability incurred by LICENSEE with respect to the infringement of any United States patent issued prior to the date of this agreement on account of the manufacture and sale of cellophane, as such, insofar as said liability arises because of the operation by LICENSEE of any process or apparatus used by LICENSEE pursuant to this agreement and which conforms to that used by DU PONT at the date of this agreement in its cellophane manufacture, provided, however, that the obligations of DU PONT hereunder shall not extend to any patent under which LICENSEE may obtain a license on reasonable terms and provided further that DU PONT shall have the right, if LICENSEE invokes the provisions of this paragraph, to control and dispose of any questions with respect to such liability of LICENSEE.

XI. PATENT MARKING

LICENSEE agrees that all cellophane manufactured and sold by it under any product or article claim of any of the patents licensed herein shall be marked with the word "Patent", followed by the patent number, in conformity with DU PONT'S practice. It is understood that any system of patent marking under this paragraph which conforms to the requirements of the patent marking statutes may be used by LICENSEE.

XII. FORCE MAJEURE

Neither party shall be responsible to the other for delay or failure in performance of any of the obligations imposed by this agreement, provided such failure shall be occasioned by fire, flood, explosion, lightning, windstorm, earthquake, subsidence of soil,

failure of machinery or equipment or supply of materials, discontinuity in the supply of power, governmental interference, civil commotion, riot, war, strikes, labor disturbance, transportation difficulties, labor shortage or by any cause of like or unlike nature beyond the reasonable control of such party.

XIII. ASSIGNMENT.

This contract, together with all rights and obligations hereunder, shall, except for the services required of DU PONT hereunder, be freely assignable by DU PONT, and shall inure to the benefit of and be binding upon the successors and assigns of the entire cellophane business of LICENSEE, but shall not otherwise be assignable by LICENSEE.

XIV. INTEGRATION

This instrument embodies the entire agreement of the parties with respect to its subject matter and there are no agreements or understandings relating to such subject matter not set forth in this agreement. No future modification of this agreement shall have any force or effect unless in writing and signed by the party claimed by the other party to be bound thereby.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed in duplicate by their respective proper officers and their respective corporate seals to be hereunto affixed.

Law.
H. C. Haskell

E. I. DU PONT DE NEMOURS AND COMPANY

By _____
GENERAL MANAGER RAYON DEPARTMENT

Attest:

_____
Asst. Secretary

OLIN INDUSTRIES, INC.

By _____
President

Attest:

_____
Secretary

EXHIBIT A

TYPES OF CELLOPHANE AND THEIR RATIOS TO EACH OTHER, FOR WHICH THE CAPACITY OF THE FIRST PLANT IS RATED

Type	% of Total Annual Production	
300 PT	3.0	
450 PT	1.5	
Total Plain		4.5
300 MST-51	21.5	
300 MST-52	20.1	
300 MST-53	13.1	
300 MSAT-80	9.1	
300 MSAT-86	2.2	
300 MSAT-87	1.8	
300 LSAT	9.1	
450 MST-52	3.0	
450 MST-53	8.0	
450 MSAT-80	3.0	
450 MSAT-86	1.3	
450 MSAT-87	0.3	
450 LSAT	3.0	
Total Moistureproof		95.5
Grand Total		100.0

Explanation of Symbols

300 - approx. .0009 in. thick
450 - " .0014 in. "
A - Anchored (water resistant)
L - Less moistureproof than type M
M - "Moistureproof"
P - Plain (Non-moistureproof)
S - Heat-sealing
T - Transparent (Uncolored)

Defendant's Exhibit No. 975

6130

SUPPLEMENTAL AGREEMENT

THIS SUPPLEMENTAL AGREEMENT, made this 17th day of February, 1950, at Wilmington, Delaware by and between E. I. DU PONT DE NEMOURS AND COMPANY, a corporation organized and existing according to the laws of the State of Delaware and having its principal place of business at Wilmington, Delaware, hereinafter called "Du Pont", and OLIN INDUSTRIES, INC., a corporation organized and existing according to the laws of the State of Delaware, and having a place of business at East Alton, Illinois, hereinafter called "Licensee".

WITNESSETH:

WHEREAS, the parties hereto entered into an agreement, hereinafter called the "main agreement", made on the 4th day of November, 1949, relating to cellophane, and,

WHEREAS, Licensee wishes and Du Pont is willing to provide for additional facilities for cellophane manufacture, and,

WHEREAS, the parties wish to amplify the main agreement in other respects hereinafter set forth;

NOW, THEREFORE, in consideration of the premises and the undertakings hereinafter set forth, it is agreed as follows:

I. ADDITIONAL WORK

To the first plant as provided in paragraph (j) of Article III of the main agreement, there shall be added one additional cellophane casting machine and one machine for coating cellophane by means of an aqueous dispersion with accessories appertaining to said machine. However, no increase is to be made in any other facilities beyond those to be installed for the first plant. It is specifically understood that neither the first plant nor the aforesaid additional facilities include any facilities for the production of power or steam. Each party extends its obligations set forth in the main agreement with respect to the first plant to said additional facilities in the same way and to

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the same extent as if said additional facilities were specifically provided for in the main agreement.

II. ESTIMATES

The additional facilities herein provided for are estimated to add approximately One Million Dollars ($1,000,000) to the cost of the design and construction work. It is understood that the withholding by Licensee of authorizations regarding the cellophane manufacturing facilities has already caused delay in performance by Du Pont, but it is presently estimated that the first plant and the additional casting machine will require twenty-seven (27) months from the date of the main agreement for completion. The completion of the dispersion coating machine herein provided for is estimated to require fifteen (15) months after basic data has been established and formal instructions have been given by Licensee to proceed. Except as provided in Paragraph (f) of Article VI of the main agreement, performance of the agreement shall in no way be affected or influenced by the aforesaid cost or time estimates, and Du Pont assumes no liability in the event any or all of the said estimates prove to be incorrect.

III. PATENT LICENSES

The Licenses granted in Paragraph (a) of Article V of the main agreement are hereby extended to include the right to make and to have made equipment for use by Licensee in cellophane manufacture.

IV. PROCUREMENT

In the procurement of materials, machinery and utilities pursuant to Paragraph (e) of Article III of the main agreement Du Pont shall act as an agent of Licensee.

V. PAYMENTS BY LICENSEE

(d) It is understood and agreed that the additional payment and obligation under Paragraph (a) of Article VII of the main agreement shall apply to any production capacity of Licensee attained in excess of thirty-three million, seven hundred thousand pounds (33,700,000) of cellophane a year up to, but not beyond, additional capacity of thirty-three million, seven hundred thousand pounds (33,700,000) of cellophane a year.

(b) In consideration of the obligation assumed by Du Pont with respect to the design and construction of said additional facilities, Licensee agrees to pay Du Pont upon completion of said design and construction the sum of Forty Thousand Dollars ($40,000.00) in addition to the payments provided in Paragraph (c) of Article VII of the main agreement.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed in duplicate by their respective authorized representatives, and their corporate seals to be hereunto affixed. S I A 12A

E. I. DU PONT DE NEMOURS AND COMPANY

By _____
General Manager, Rayon Department

Attest:

_____
Asst. Secretary

OLIN INDUSTRIES, INC.

By _____
President

Attest:

_____
Secretary

Russell R Cantrell

Defendant's Exhibit No. 977

OLIN INDUSTRIES, INC.

EAST ALTON, ILLINOIS

December 20, 1949

Mr. J. P. Martel
Project Administrator
Engineering Department
E. I. du Pont de Nemours Co., Inc.
Wilmington 98, Delaware

Dear Mr. Martel:

In accordance with the agreement between Olin Industries, Inc. and the E. I. du Pont de Nemours and Company, dated October 28, 1949, Section III of this instrument entitled "Plant Construction and Operation" provides that du Pont will accept the obligation to perform certain functions with regard to plant construction and operation upon the request of Olin Industries.

Paragraph (a) of Section III states that "DU PONT shall assist LICENSEE in the selection of and acquisition of a plant site in accordance with DU PONT'S experience in selecting and acquiring plant sites for cellophane manufacture. LICENSEE shall have access to all data on cellophane plant site studies which have been compiled by DU PONT and shall receive the assistance of DU PONT in negotiating for the necessary utilities for such plant."

As has already been stated to your company, Olin Industries, Inc. has committed themselves to the erection of an eight machine plant on the existing properties of the Ecusta Paper Corporation located at Pisgah Forest, North Carolina.

We have also declared ourselves in that it is our present desire to pursue our study of plant sites in order that we may arrive at the proper selection of a site for our second cellophane unit. By virtue of the fact that we have now selected the site for our first cellophane unit, there is no immediate or great urgency in the selection of the second site. Nevertheless, we wish to proceed in an orderly and methodical fashion to select the best

2001

possible site for our second unit, which will take into account not only the engineering aspects of the site itself but also of the potential market distribution and raw material services. In this regard it is our desire that the site selection be the result of a careful analysis from the standpoint of its relationship to the now existing four du Pont cellophane plants, the Sylvania plant at Fredericksburg, Virginia, and the new eight cellophane unit which we will have erected at Pisgah Forest, North Carolina.

Therefore, in accordance with the above mentioned agreement, it is our desire that du Pont engineering organization as well as the cellophane manufacturing division assist us in our study of a second plant site.

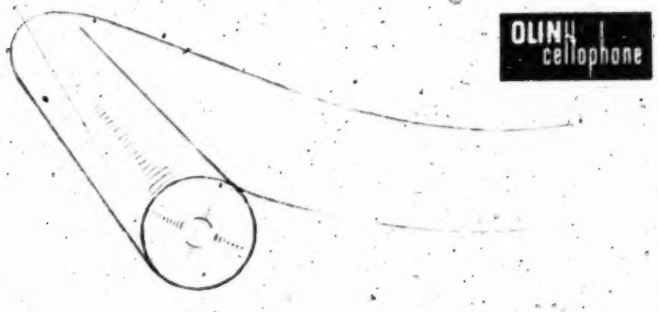
Very truly yours,

Fred Olsen
Director of Research
and Development

Fred Olsen
mlh/iw/rp
cc: Henry E. Ford
A. W. Hauge

Defendant's Exhibit No. 978

Announcing the start of production of



THE CIGARETTE PAPER AND CELLOPHANE PLANT AT PISGAH FOREST, N. C.

The cellophane used in the "window" of this folder was taken from the first run of cellophane cast by machines No. 1 and No. 2 during the week of June 11th, 1951, and therefore signalizes the start up of our manufacture of high grade cellophane.

ECUSTA PAPER CORPORATION
SUBSIDIARY OF OLIN INDUSTRIES, INC.
PISGAH FOREST, NORTH CAROLINA, U. S. A.

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DU PONT CELLOPHANE PRODUCTION BY TYPES

1925, 1929, 1939, 1949

Source: Production Records, E. I. du Pont de Nemours & Co., Film Dep't.

1925

	Thousands of Pounds		Per Cent of Total
Plain Cellophane:			
Plain Transparent & Colored (PT)	941		
Plain Transparent & Colored—Embossing (PET)	3		
Total Plain Cellophane		944	100.0
Total All Cellophane		944	100.0

1929

Plain Cellophane:			
Plain Transparent & Colored (PT)	4,410		
Plain Transparent & Colored (PET)	14		
Total Plain Cellophane		4,424	73.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	1,626		
Total Moistureproof		1,626	26.9
Other Moistureproof Cellophanes:			
Moistureproof Anchored Transparent (MAT)	4		
Less—Moistureproof Transparent & Colored (LT)	2		
Total Other Moistureproof Cellophanes		6	.1
Total All Cellophanes		6,056	100.0

1939

Plain Cellophane:			
Plain Transparent & Colored (PT)	16,224		
Plain Transparent & Colored—Embossing (PET)	70		
Plain Opaque & Colored Opaque (PO)	14		
Plain Rancidity Retardant—Colored (PRC)	309		
Plain Transparent & Colored—High Humidity Use (PHT)	903		
Plain Transparent—Unsized (PUT)	950		
Plain—Flame Resistant T&C (PJT)	38		
Total Plain Cellophane:		18,508	25.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	15,707		
Moistureproof Transparent—High Softener (MT-35)	572		
Total Moistureproof Cellophane		16,279	22.0

DU PONT CELLOPHANE PRODUCTION BY TYPES

1925, 1929, 1939, 1949

1939 (Cont'd.)	Thousands of Pounds		Per Cent of Total
Moistureproof Heat-Sealing Cellophane:			
Moistureproof—Heat Sealing—Transparent & Colored (MST)	13,058		
Moistureproof—Heat Sealing—Rancidity Retardant—Colored (MS -)	1		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags (MST-53)	23,880		
Moistureproof—Heat Sealing—One Side Coated—Transparent & Opaque (MSDT)	462		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags—Heavy Coating (MST-57)	339		
Moistureproof—Heat Sealing—Transparent—Not Seasonally Adjusted—Heavy Coating (MST-56)	113		
Total Moistureproof Heat Sealing Cellophane		37,853	51.0
Other Moistureproof Cellophanes:			
Moistureproof—Heat Sealing—Anchored—Transparent & Colored—Normal & Extra Durability (MSAT)	442		
Less Moistureproof Transparent & Colored (LT)	424		
Less Moistureproof—Heat Sealing—Transparent (LST)	420		
Less Moistureproof—Anchored—Transparent & Colored (LAT)	222		
Total Other Moistureproof Cellophanes		1,508	2.0
Total All Cellophanes		74,148	100.0

1949			
Plain Cellophane:			
Plain Transparent & Colored (PT)	12,219		
Plain Opaque & Colored Opaque (PO)	14		
Plain Rancidity Retardant—Colored (PRC)	371		
Plain Transparent & Colored—High Humidity Use (PHT)	766		
Plain Transparent—Unsized (PUT)	3,193		
Plain Flame Resistant—T&C (PJT)	308		
Plain Transparent—Lower Durability than PT-62—Foliating Trade (PT-63)	36		
Total Plain Cellophane		16,907	9.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	21,762		
Moistureproof Transparent—High Softener (MT-35)	1,001		
Moistureproof Transparent—Special for Cigars (MT-32)	2,012		
Moistureproof Transparent—Special for Candy (MT-36)	522		
Total Moistureproof Cellophane		25,297	14.0

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DU PONT CELLOPHANE PRODUCTION BY TYPES

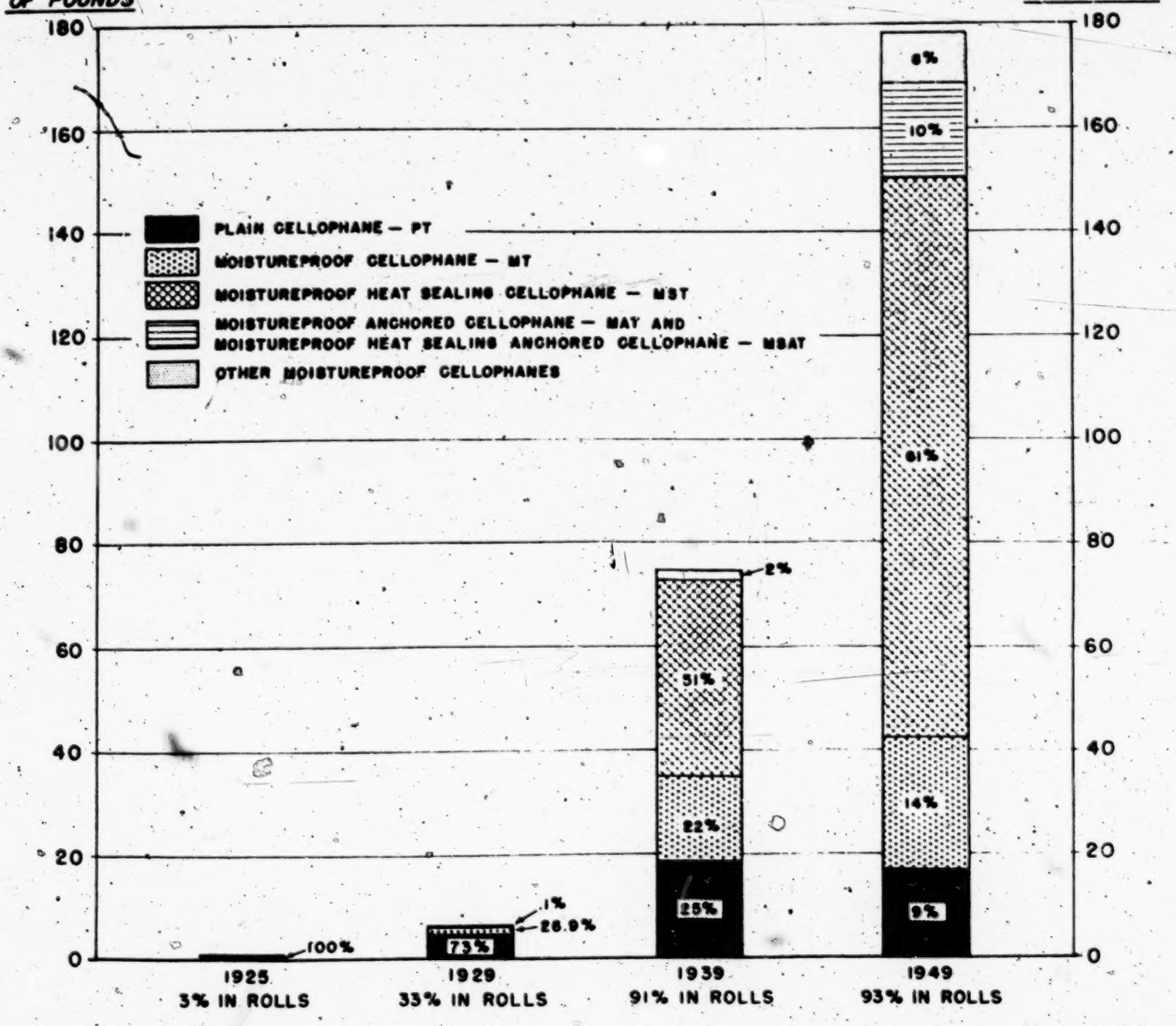
1925, 1929, 1939, 1949

1949 (Cont'd.)	Thousands of Pounds		Per Cent of Total
Moistureproof Heat Sealing Cellophane:			
Moistureproof—Heat Sealing—Transparent & Colored (MST)	43,737		
Moistureproof—Heat Sealing—Rancidity Retardant—Colored (MSRC)	36		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags (MST-53)	29,705		
Moisturepoof—Heat Sealing—T&C—Special Softener for Bread (MST-51)	28,266		
Moistureproof—Heat Sealing—One Side Coated—Transparent & Opaque (MSDT)	1,739		
Moistureproof—Heat Sealing—Flame Resistant—T&C (MSJC)	20		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags—Heavy Coating (MST-57)	335		
Moistureproof—Heat Sealing—Transparent—Not Seasonally Adjusted—Heavy Coating (MST-56)	970		
Moistureproof—Heat Sealing—Transparent—Low Softener—Minimum Shrinkage (MST-50)	210		
Moistureproof—Heat Sealing—Transparent—Special Formula for Cigars & Cigarettes (MST-58)	3,168		
Moistureproof—Heat Sealing—Transparent—Special Coating (K-202)	108		
Total Moistureproof Cellophane		108,295	61.0
Moistureproof—Anchored & Moistureproof—Heat Sealing Anchored Cellophane:			
Moistureproof—Anchored—Transparent (MAT)	708		
Moistur proof—Anchored—Transparent—Extra Durability (MAT-2)	4,323		
Moistureproof—Heat Sealing—Anchored—T&C—Normal & Extra Durability (MSAT)	8,141		
Moistureproof—Heat Sealing—Anchored—T&C—Heavy Coating (MSAT-84)	219		
Moistureproof—Heat Sealing—Anchored—Transparent—Special for Meat Wraps (MSAT-80)	4,307		
Total Moistureproof—Anchored & Moistureproof—Heat Sealing—Anchored Cellophane		17,698	10.0
Other Moistureproof Cellophanes:			
Less Moistureproof—Transparent & Colored (LST)	2,429		
Less Moistureproof—Anchored—Transparent & Colored (LAT)	1,087		
Less Moistureproof—Heat Sealing—Anchored—T&C (LSAT)	6,954		
Total Other Moistureproof Cellophanes		10,470	6.0
Total All Cellophanes		178,667	100.0

DX.980

DU PONT CELLOPHANE PRODUCTION BY TYPES 1925, 1929, 1939 AND 1949

Source: Production Records, E. I. du Pont de Nemours & Co., Film Dep't.



1

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED[a] FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packing Materials

(Figures in Tons of 2,000 Pounds)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION AND IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers	63 037	80 938	72 677	63 059	70 555	64 366	80 828	96 967	125 040	144 328	139 972	156 380	125 451
Waxing Papers (18 Pounds and over)	36 079	64 920	48 276	44 569	59 496	73 924	124 130	141 143	173 746	193 610	218 437	246 218	180 276
Sulphite Bag and Wrapping Papers	89 241	162 510	119 306	108 657	144 485	178 937	295 480	348 346	320 424	179 711	137 458	129 577	97 816
Aluminum Foil	1 040	2 047	2 571	3 035	3 983	4 904	8 149	9 135	4 117	4 000	20 100	35 063	42 697
Cellophane	530	974	3 351	14 204	21 199	28 933	40 930	50 040	70 368	63 865	63 507	87 279	114 424
Cellulose Acetate				5	167	509	1 077	1 498	2 695	3 094	4 010	4 101	4 194
Pliofilm, Polyethylene, Saran and Cry-O-Rap[b]		Not available until 1947										2 868	13 152
Total	189 927	311 389	246 181	233 529	299 885	352 073	550 594	647 129	696 390	588 608	583 484	661 486	578 010
Total Du Pont Cellophane Production	472	945	3 028	12 310	16 981	21 904	30 511	37 074	53 175	48 826	48 201	66 751	89 333
Du Pont Cellophane Per Cent of Total United States Production and Imports of Selected Flexible Packaging Materials	0.2%	0.3%	1.2%	5.3%	5.7%	6.2%	5.5%	5.7%	7.6%	8.3%	8.3%	10.1%	15.5%

NOTES: (a) As defined in this offer.
(b) Combined to avoid disclosure of figures for individual firms.

2013

5595

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED(a) FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in Tons of 2,000 Pounds)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers	61 841	80 110	71 915	62 876	70 239	64 577	80 100	96 630	125 032	144 324	139 969	156 310	125 430
Waxing Papers (18 Pounds and over)	35 780	64 483	47 859	44 311	59 329	73 712	123 896	141 007	173 687	193 553	218 427	246 131	180 215
Sulphite Bag and Wrapping Papers	86 610	156 090	115 851	107 262	143 614	178 431	294 796	346 468	318 212	179 500	136 771	119 040	95 960
Aluminum Foil	1 000	1 500	2 000	2 500	3 678	4 432	6 787	7 721	4 000	4 000	20 000	35 022	42 500
Cellophane	472	945	3 028	14 185	21 164	28 798	40 856	50 004	70 350	63 865	63 507	87 275	114 419
Cellulose Acetate				5	167	509	1 077	1 498	2 695	3 094	4 010	4 101	4 194
Pliofilm, Polyethylene, Saran and Cry-O-Rap(b)	Not available until 1947											2 868	13 152
Total	185 703	303 128	240 653	231 139	298 191	350 459	547 512	643 328	693 976	588 336	582 684	650 747	575 870

NOTES: (a) As defined in this offer.
(b) Combined to avoid disclosure of figures for individual firms.

SOURCES: Figures based on official U. S. Department of Commerce Bureau of the Census, publications and official U. S. Department of Commerce tabulations certified by the Director, Bureau of the Census. In some years where U. S. Census figures were incomplete, estimates were made based on available official statistics and records of individual companies kept in the normal course of business.

2014

55596

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in Tons of 2,000 Pounds)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers[a]	1 196	828	762	183	316	289	728	337	8	4	3	70	21
Waxing Papers (18 Pounds and over)[b]	299	437	417	258	167	212	234	136	59	57	10	87	61
Sulphite Bag and Wrapping Papers[c]	2 631	6 420	3 455	1 395	871	506	684	1 878	2 212	211	687	10 537	1 856
Aluminum Foil	40	547	571	535	305	472	1 362	1 414	117	*	100	41	197
Cellophane[d]	58	29	323	19	35	135	74	36	18	*	*	4	5
Cellulose Acetate[e]													
Pliofilm, Polyethylene, Saran and Cry-O-Rap[f]													
Total	4 224	8 261	5 528	2 390	1 694	1 614	3 082	3 801	2 414	272	800	10 739	2 140

NOTES: (a) Includes "Grease-proof and imitation parchment paper, super calendered and transparent (include glassine paper)", "Vegetable parchment paper by whatever name known", and "Grease-proof and imitation parchment paper, n.s.p.f.)".

(b) Listed as "Paraffined or wax-coated paper" and includes "Bags and articles of surface-coated, parchment or similar papers".

(c) Includes M.G. and M.F. Sulphite wrapping and "Other wrapping, n.e.s." "Other wrapping, n.e.s." has been reduced 10% to eliminate non-competitive wrapping papers.

(d) Listed as "Cellulose products, n.e.s.: Sheets, bands, and strips of transparent cellulose film exceeding 1 inch in width but not exceeding 3/1000 inch in thickness made from cellulose, except cellulose acetate". Excludes converted film such as bags, etc., for which only dollar figures are available.

(e) Cellulose acetate omitted from this schedule because film is not reported separately.

(f) No imports reported.

* Less than 1 ton.

SOURCES: Figures based on an official U. S. Department of Commerce Schedule, certified by the Director, Bureau of the Census, entitled "Imports for Consumption of Certain Flexible Materials Suitable for Wrapping 1923-1949".

2015

5597

DX.982

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED[a] FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION AND IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers	1 566 059	2 013 782	1 808 420	1 570 560	1 756 801	1 615 221	2 011 334	2 414 879	3 115 643	3 595 069	3 485 013	3 896 363	3 125 826
Waxing Papers (18 Pounds and over)	921 468	1 658 834	1 232 856	1 139 125	1 521 921	1 890 979	3 176 067	3 612 329	4 447 526	4 956 057	5 591 983	6 302 690	4 614 685
Sulphite Bag and Wrapping Papers	1 631 813	2 971 571	2 181 573	1 986 852	2 641 985	3 271 957	5 402 994	6 369 680	5 859 110	3 286 108	2 513 482	2 369 374	1 788 615
Aluminum Foil	32 093	63 191	79 347	93 674	122 929	151 366	251 525	281 932	127 079	123 459	620 379	1 082 181	1 317 807
Cellophane	16 280	29 843	102 323	430 403	644 016	876 993	1 234 808	1 513 491	2 111 757	1 989 680	1 884 131	2 648 278	3 366 068
Cellulose Acetate				168	5 339	17 089	35 806	49 293	89 188	103 470	133 098	133 389	133 982
Pliofilm, Polyethylene, Saran and Cry-O-Rap[b]		Not available prior to 1947										83 994	373 871
Total	4 167 713	6 737 221	5 404 519	5 220 782	6 692 991	7 823 605	12 112 534	14 241 604	15 750 303	14 053 843	14 228 086	16 516 269	14 720 854
Total Du Pont Cellophane Production	14 480	28 950	92 351	372 610	515 324	663 655	920 395	1 121 637	1 596 210	1 521 428	1 430 920	2 025 148	2 629 747
Du Pont Cellophane Per Cent of Total United States Production and Imports of Selected Flexible Packaging Materials	0.3%	0.4%	1.7%	7.1%	7.7%	8.5%	7.6%	7.9%	10.1%	10.8%	10.1%	12.3%	17.9%

NOTES: (a) As defined in this offer.
(b) Combined to avoid disclosure of figures for individual firms.

2016

5598

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers (Glassine and Greaseproof: Average basis weight 25# (24 x 36 — 500) Vegetable Parchment: Average basis weight 35# (24 x 36 — 500)	1 540 913	1 996 134	1 791 931	1 566 708	1 750 172	1 609 089	1 995 882	2 407 768	3 115 473	3 594 979	3 484 955	3 894 835	3 125 386
Waxing Paper (18 Pounds and over) (Average basis weight 25# (24 x 36 — 480)	915 979	1 650 785	1 225 205	1 134 375	1 518 841	1 887 050	3 171 776	3 609 823	4 446 441	4 955 017	5 591 799	6 301 030	4 613 560
Sulphite Bag and Wrapping Papers (Average basis weight 35# (24 x 36 — 480)	1 583 707	2 854 183	2 118 393	1 961 339	2 626 053	3 262 699	5 390 490	6 335 338	5 818 664	3 282 246	2 500 925	2 176 705	1 754 676
Aluminum Foil (Average yield 20,000 square inches per pound)	30 864	46 296	61 728	77 160	113 517	136 793	209 479	238 305	123 457	123 457	617 284	1 080 926	1 311 728
Cellophane	14 480	28 950	92 351	429 805	642 932	872 813	1 232 511	1 512 388	2 111 196	1 989 680	1 884 128	2 648 168	3 365 926
Cellulose Acetate				168	5 339	17 089	35 806	49 293	89 188	103 470	133 098	133 389	133 982
Pliofilm, Polyethylene, Saran and Cry-O-Rap (Pliofilm: Average yield 24,000 square inches per pound Polyethylene: Average yield 15,000 square inches per pound Saran: Average yield 16,300 square inches per pound)												83 994	373 871
Total	4 085 943	6 576 348	5 289 608	5 169 555	6 656 854	7 785 533	12 035 944	14 152 915	15 704 419	14 048 849	14 212 189	16 319 047	14 679 129

SOURCES: Figures based on official U. S. Department of Commerce, Bureau of the Census, publications and official U. S. Department of Commerce tabulations certified by the Director, Bureau of the Census. In some years where U. S. Census figures were incomplete, estimates were made based on available official statistics and records of individual companies kept in the normal course of business.

Average basis weights of wrapping papers obtained from Dr. Louis T. Stevenson, Economist, American Paper and Pulp Association. Average yield per pound for Aluminum Foil, Pliofilm, Polyethylene and Saran obtained from the manufacturers of these packaging materials. Cellophane, Cellulose Acetate and Cry-O-Rap manufacturers reported production in both pounds and square yards.

2017

5599

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers[a] (Glassine and Greaseproof: Average basis weight 30# (24 x 36 — 500)[b] Vegetable Parchment: Average basis weight 35# (24 x 36 — 500))	25 146	17 648	16 489	3 852	6 629	6 132	15 452	7 111	170	90	58	1 528	440
Waxing Papers (18 Pounds and over)[c] (Average basis weight 25# (24 x 36 — 480)	5 489	8 049	7 651	4 750	3 080	3 929	4 291	2 506	1 085	1 040	184	1 660	1 125
Sulphite Bag and Wrapping Papers[d] (Average basis weight 35# (24 x 36 — 480)	48 106	117 388	63 180	25 513	15 932	9 258	12 504	34 342	40 446	3 862	12 557	192 669	33 939
Aluminum Foil (Average yield 20,000 square inches per pound)	1 229	16 895	17 619	16 514	9 412	14 573	42 046	43 627	3 622	2	3 095	1 255	6 079
Cellophane[e] (Average yield 20,000 square inches per pound)	1 800	893	9 972	598	1 084	4 180	2 297	1 103	561	—	3	110	142
Cellulose Acetate[f]													
Pliofilm, Polyethylene, Saran and Cry-O-Rap[g]													
Total	81 770	160 873	114 911	51 227	36 137	38 072	76 590	88 689	45 884	4 994	15 897	197 222	41 725

NOTES: (a) Includes "Grease-proof and imitation parchment paper, super calendered and transparent (include glassine paper)", "Vegetable parchment paper by whatever name known", and "Grease-proof and imitation parchment paper, n.s.p.f.)".

(b) Average basis weight for glassine and greaseproof papers figured at 30# (24 x 36 — 500) to account for any paper heavier than U. S. production which might have been imported under this classification.

(c) Listed as "Paraffined or wax-coated paper" and includes "Bags and articles of surface-coated, parchment or similar papers".

(d) Includes M.G. and M.F. Sulphite wrapping and "Other wrapping, n.e.s." "Other wrapping, n.e.s." has been reduced 10% to eliminate non-competitive wrapping papers.

(e) Listed as "Cellulose products, n.e.s.: Sheets, bands, and strips of transparent cellulose film exceeding 1 inch in width but not exceeding 3/1000 inch in thickness made from cellulose, except cellulose acetate". Excludes converted film such as bags, etc, for which only dollar figures are available.

(f) Cellulose acetate omitted from this schedule because film is not reported separately.

(g) No imports reported.

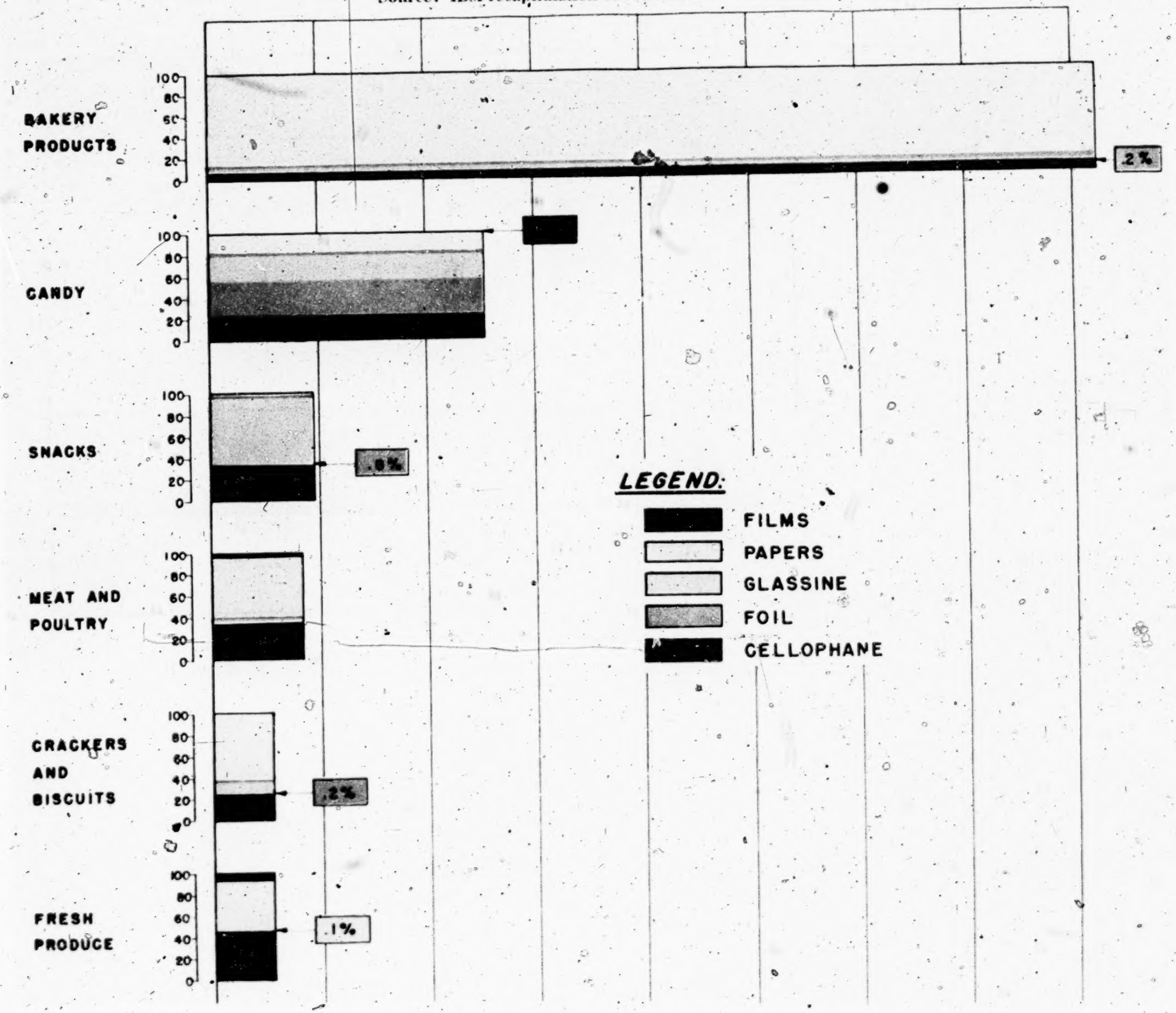
SOURCES: Figures based on an official U. S. Department of Commerce Schedule, certified by the Director, Bureau of the Census, entitled "Imports for Consumption of Certain Materials Suitable for Wrapping 1923-1949". Average basis weight of wrapping papers obtained from Dr. Louis T. Stevenson, Economist, American Paper & Pulp Association. (See Note (b). Average yield per pound of Aluminum Foil and Cellophane obtained from the manufacturers of these packaging materials.

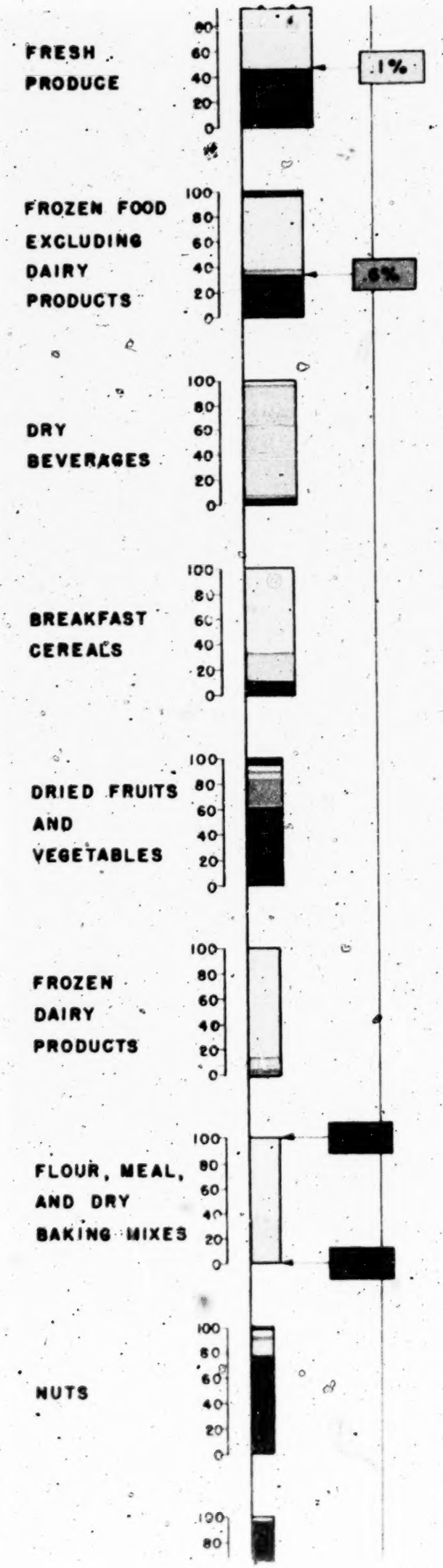
FLEXIBLE PACKAGING MATERIALS

IMPORTANCE OF MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(BASED ON ANALYSIS OF 1949 SALES OF 19 CONVERTERS)

Source: IBM recapitulation of records of 19 converters.




FRESH PRODUCE
80
60
40
20
0
.1%
FROZEN FOOD EXCLUDING DAIRY PRODUCTS
100
80
60
40
20
0
.6%
DRY BEVERAGES
100
80
60
40
20
0
BREAKFAST CEREALS
100
80
60
40
20
0
DRIED FRUITS AND VEGETABLES
100
80
60
40
20
0
FROZEN DAIRY PRODUCTS
100
80
60
40
20
0
FLOUR, MEAL, AND DRY BAKING MIXES
100
80
60
40
20
0
NUTS
100
80
60
40
20
0
100
80

3610 0196

PRINCIPAL COMPETITORS OF DU PONT IN MANUFACTURE OF COMPETING FLEXIBLE PACKAGING MATERIALS

SOURCE: MOODY'S INDUSTRIALS, 1950

	Organized	Flexible Packaging Materials Manufactured	1949 Total Assets (M Dollars)	1949 Net Assets (M Dollars)	1949 Sales (M Dollars)
Riegel Paper Corporation ..	1873	Glassine & greaseproof, waxing paper, other specialty papers	15285	12737	22992
Rhinelander Paper Company	1903	Glassine & greaseproof	14720	10158	13410
Westfield River Paper Company, Inc.	1916	Glassine	2132	1236	n.a.
Deerfield Glassine Company.	1927	Glassine	2089	1805	2781
Paterson Parchment Paper Company	1889	Vegetable parchment & greaseproof.	6316	5878	5254
Kalamazoo Vegetable Parchment Company	1909	Vegetable parchment & greaseproof.	29269	17193	34042
Marathon Corporation	1909	Sulphite and sulphate paper & paperboard	61888	43145	60048
Consolidated Water Power & Paper Company	1894	Sulphite, wrapping tissue & coated papers	45066	32760	41241
Fraser Companies Ltd. (owns Fraser Paper Co.)	1917	Sulphite and groundwood specialty papers	37862	31569	n.a.
Visking Corporation	1925	Polyethelene film	14893	10669	19821
Hartford-Empire Company (owns Plax Corp.)	1922	Polyethelene film	18753	8421	12855
Dewey & Almy Chemical Company	1919	Cry-O-Rap	12308	4982	16297
Dow Chemical Company....	1897	Saran film	294337	189986	200371
Goodyear Tire & Rubber Company	1898	Pliofilm	424126	214294	663506
Celanese Corporation of America	1918	Acetate film	154886	154259	171292
Eastman Kodak Company ..	1881	Acetate film	379697	318501	396233
Reynolds Metals Company..	1928	Aluminum foil	177479	55103	131865
Aluminum Corporation of America	1888	Aluminum foil	525870	312536	347108
American Viscose Corporation (Acquired Sylvania 1946)	1910	Cellophane	222396	191570	194664
Total of above Companies ..			2539366	1616802	2333780

DX.984

MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(Millions of Square Inches)
(Adjusted July 1951)

	Quantity	Per Cent of Total End Use
Bakery Products		
Cellophane	109,670	6.8
Foil	2,652	.2
Glassine	72,216	4.4
Papers	1,440,413	88.6
Films	215	.0
	1,625,166	100.0
Candy		
Cellophane	134,280	24.4
Foil	178,967	32.5
Glassine	117,634	21.4
Papers	119,102	21.6
Films	484	.1
	550,467	100.0
Snacks		
Cellophane	61,250	31.9
Foil	1,571	.8
Glassine	120,556	62.8
Papers	8,439	4.4
Films	79	.1
	191,895	100.0
Meat and Poultry		
Cellophane	59,016	34.9
Foil	88	.1
Glassine	4,524	2.7
Papers	97,255	57.5
Films	8,173	4.8
	169,056	100.0
Crackers and Biscuits		
Cellophane	29,960	26.6
Foil	192	.2
Glassine	11,253	10.0
Papers	71,147	63.2
Films	8	.0
	112,560	100.0
Fresh Produce		
Cellophane	52,828	47.2
Foil	43	.1
Glassine	96	.1
Papers	51,035	45.6
Films	7,867	7.0
	111,869	100.0

MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(Millions of Square Inches)
(Adjusted July 1951)

	Quantity	Per Cent of Total End Use
Frozen Food Excluding Dairy Products		
Cellophane	31,684	33.6
Foil	629	.7
Glassine	1,943	2.1
Papers	56,925	60.3
Films	3,154	3.3
	94,335	100.0
Dry Beverages		
Cellophane	5,188	6.4
Foil	758	.9
Glassine	69,923	86.7
Papers	4,785	5.9
Films	35	.1
	80,689	100.0
Breakfast Cereals		
Cellophane	9,884	12.6
Foil	—	—
Glassine	14,394	18.4
Papers	54,140	69.0
Films	—	—
	78,418	100.0
Dried Fruits and Vegetables		
Cellophane	34,023	63.7
Foil	11,965	22.4
Glassine	1,882	3.5
Papers	3,272	6.2
Films	2,247	4.2
	53,389	100.0
Frozen Dairy Products		
Cellophane	564	1.1
Foil	1,547	3.1
Glassine	4,350	8.7
Papers	43,619	87.1
Films	—	—
	50,080	100.0
Flour, Meal, and Dry Baking Mixes		
Cellophane	193	.5
Foil	—	—
Glassine	14,919	35.9
Papers	26,283	63.3
Films	126	.3
	41,521	100.0

MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(Millions of Square Inches)
(Adjusted July 1951)

	Quantity	Per Cent of Total End Use
Nuts		
Cellophane	25,076	77.3
Foil	—	—
Glassine	4,622	14.2
Papers	1,976	6.1
Films	787	2.4
	32,461	100.0
Paste Goods		
Cellophane	31,211	97.4
Foil	—	—
Glassine	—	—
Papers	809	2.5
Films	13	.1
	32,033	100.0
All Other Foods		
Cellophane	47,828	13.0
Foil	13,065	3.5
Glassine	35,387	9.6
Papers	250,831	67.9
Films	22,100	6.0
	369,211	100.0
Textile Products		
Cellophane	32,228	62.3
Foil	26	.0
Glassine	7,275	14.1
Papers	10,285	19.9
Films	1,917	3.7
	51,731	100.0
Paper Products		
Cellophane	16,832	38.0
Foil	7	.0
Glassine	1,897	4.3
Papers	25,315	57.1
Films	282	.6
	44,333	100.0
Miscellaneous Non-Food Products		
Cellophane	32,269	21.2
Foil	11,151	7.3
Glassine	8,197	5.4
Papers	98,564	64.7
Films	2,064	1.4
	152,245	100.0

MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(Millions of Square Inches)
(Adjusted July 1951)

	Quantity	Per Cent of Total End Use
No End Use Known		
Cellophane	87,044	39.7
Foil	3,661	1.7
Glassine	44,934	20.5
Papers	76,717	34.9
Film	7,109	3.2
	219,465	100.0
GRAND TOTAL	4,060,924	

NOTES:

1. "All Other Food Products" includes Sandwiches, Dessert Mixes, Shortening, Sugar, Yeast, Fish, and Dairy Products (Not Frozen).
2. "Miscellaneous Non-Food Products" includes Kitchen and Bath Supplies, Rubber and Plastic Products, Drugs and Cosmetics, Products N.E.C., and Tobacco Products (a very small part of the tobacco market).
3. "No End Use Known" is principally stock bags.
4. Source of table—IBM recapitulation of records of 19 converters—1949.

5605

ANALYSIS 1949 SALES FLEXIBLE PACKAGING MATERIALS

984 A

COMPANY NO. POSTED BY DATE

PAGE NO. CHECKED BY DATE

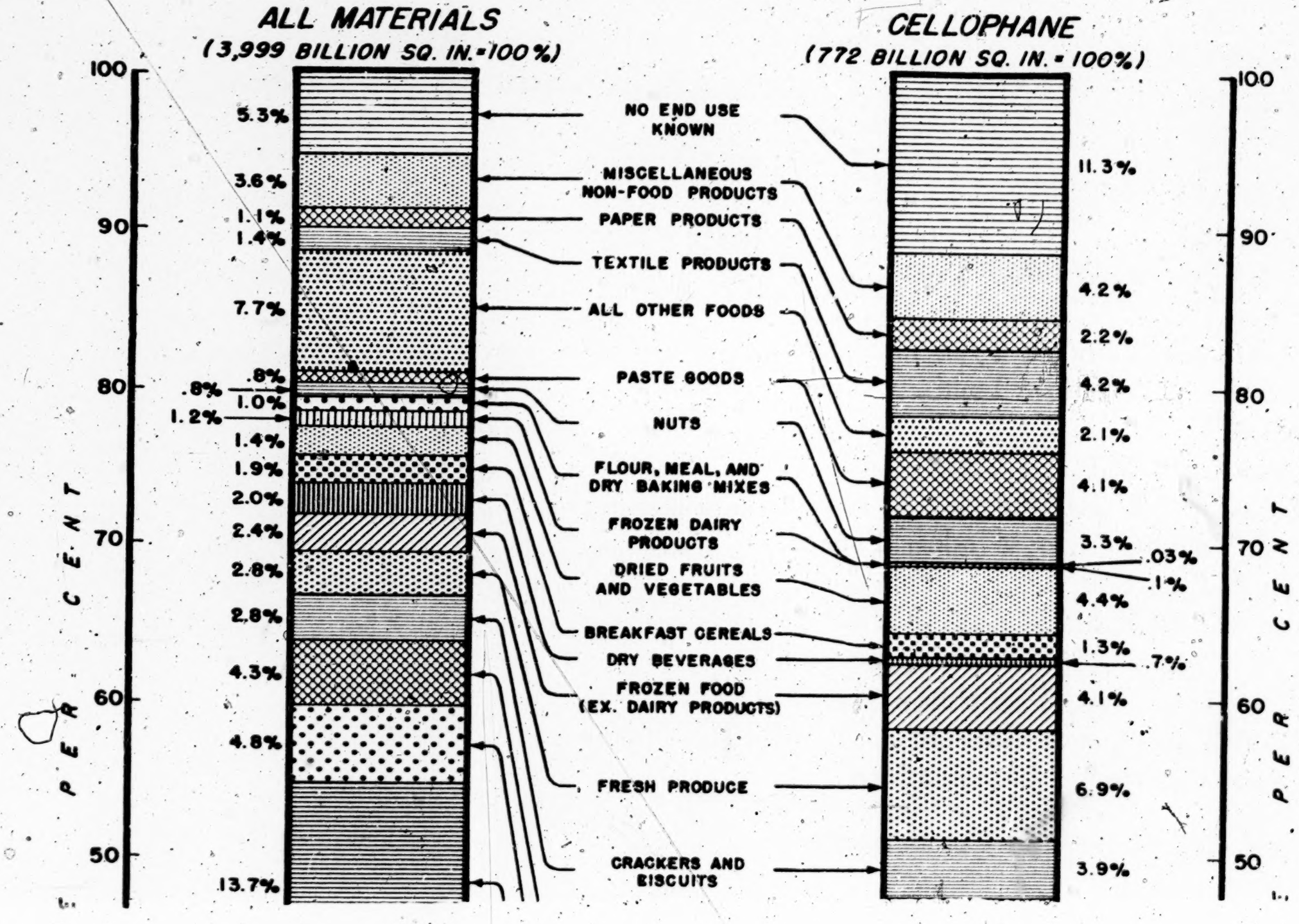
CUSTOMER	ORDER NO.	INVOICE NO.	AMOUNT DOLLARS ONLY	QUANTITY		DESCRIPTION OF PRODUCT SOLD			END USE OF PRODUCT	REMARKS	CONVERSION			
				NUMBER.	UNIT	BAG, POUCH, WRAP, ETC. DIMENSIONS AND CAPACITY	MATERIAL USED—CELLOPHANE GLASSINE FOIL ETC	IMPRINTED YES or NO			WEIGHT FACTOR	WEIGHT POUNDS	AREA FACTOR	AREA SQ IN
	BROUGHT FORWARD													

FLEXIBLE PACKAGING MATERIALS

RELATIVE IMPORTANCE OF PRINCIPAL END USES ALL MATERIALS AND CELLOPHANE

(BASED ON ANALYSIS OF 1949 SALES OF 19 CONVERTERS)

Source: IBM Recapitulation of Records of 19 Converters.



984B

Instructions for Use of Form

"Analysis 1949 Sales - Flexible Packaging Materials"

General

This form is to be used for the compilation of data to be furnished to Robert Heller & Associates in order to permit consolidation with figures being obtained by them from other converters.

Forms are in pads of 50 sheets with several carbons at the back of each pad for use by participants who may wish to make and keep a duplicate copy of data supplied. Upon request, RH&A will supply a sufficient number of sheets for this purpose.

Please use No. 2-1/2 lead pencil or its equivalent.

A "Company No." will be assigned to each converter by RH&A before collection of the completed forms. This item should be left blank until the number is assigned, then entered on each page.

Page numbers should be filled in consecutively, beginning with (1), as the work proceeds. If division of labor makes it necessary to delay consecutive numbering until finished sections of the analysis can be merged, tentative numbers should be placed in the upper left-hand corner of the sheet to the left of the perforation. Final page numbers should be filled in as soon as practicable.

Leave first ("Brought Forward") and last ("Total") lines blank on each sheet.

Initials of the person posting to the form and of the person checking it, and the dates, should appear on each page in the space provided at the right of the heading.

Arrangement of Data

A separate line should be used for each product of each material for each end use, but wherever possible source records should be arranged in such order to permit posting of like items on consecutive lines so that subtotals of identical items may be struck and the work of conversion and summarization simplified. Leave a blank line wherever such a subtotal can be struck.

Customer

Use this column for customer identification which may be useful in the preparation of the data. A perforation to the right of this column has been provided for the purpose of deleting such identification before the sheets are turned over to RH&A. If, however, a customer is himself a converter, his name should be shown in the "Remarks" column. (Identity of converter customers is necessary in order to avoid duplication in the assembly of composite figures for all participants.)

Order No. and/or Invoice No.

Show here the number of the order and/or invoice on which the recorded information will be found. Reference to a document kept in the regular course of business is necessary to support each item of the data being compiled on these forms. (Depending upon the internal practices of individual companies, it is believed that either orders or invoices will be the principal source of detailed information required for this analysis.)

Amount (Dollars Only)

Enter here the sales dollar value (omitting cents) of each item for which quantity is entered in the next column. The total of this column will be the converter's 1949 volume of sales of products included in the analysis.

Quantity (Number and Unit)

Show here the number of units and identify the unit in which it is expressed (bags, rolls, etc.).

Description of Product Sold (Type and Material)

Describe final product, i.e., bag, pouch, envelope, wrap, etc., and, if multiwall construction, indicate whether duplex or triplex. Give size and shape in sufficient detail to permit computation of area of material contained in the product, and in the case of bags indicate capacity, i.e., 1 lb., 2 lb., etc., if known.

Material used should be specified in sufficient detail to permit subsequent grouping of like materials. In the case of laminates or multiwall construction, describe the material of each layer. Identify all material by gauge or weight, and finish. Standard specifications may be used, i.e., 300 MST Cellophane, 20 lb. plain glassine, 45 lb. wax-laminated glassine/glassine etc.

Indicate by "Yes" or "No" whether the product is printed.

End Use of Product

Describe end use as specifically as possible, avoiding generalities such as "bakery products", "candy", and "meat products", in favor of "bread", "cake", "crackers", "chocolate bars", "gum drops", "bacon", "sausage", etc. In the case of fresh vegetables and frozen foods, indicate specific vegetable or food if known. This is important for the purpose of establishing beyond question that various flexible packaging materials are in direct competition for identical applications.

Remarks

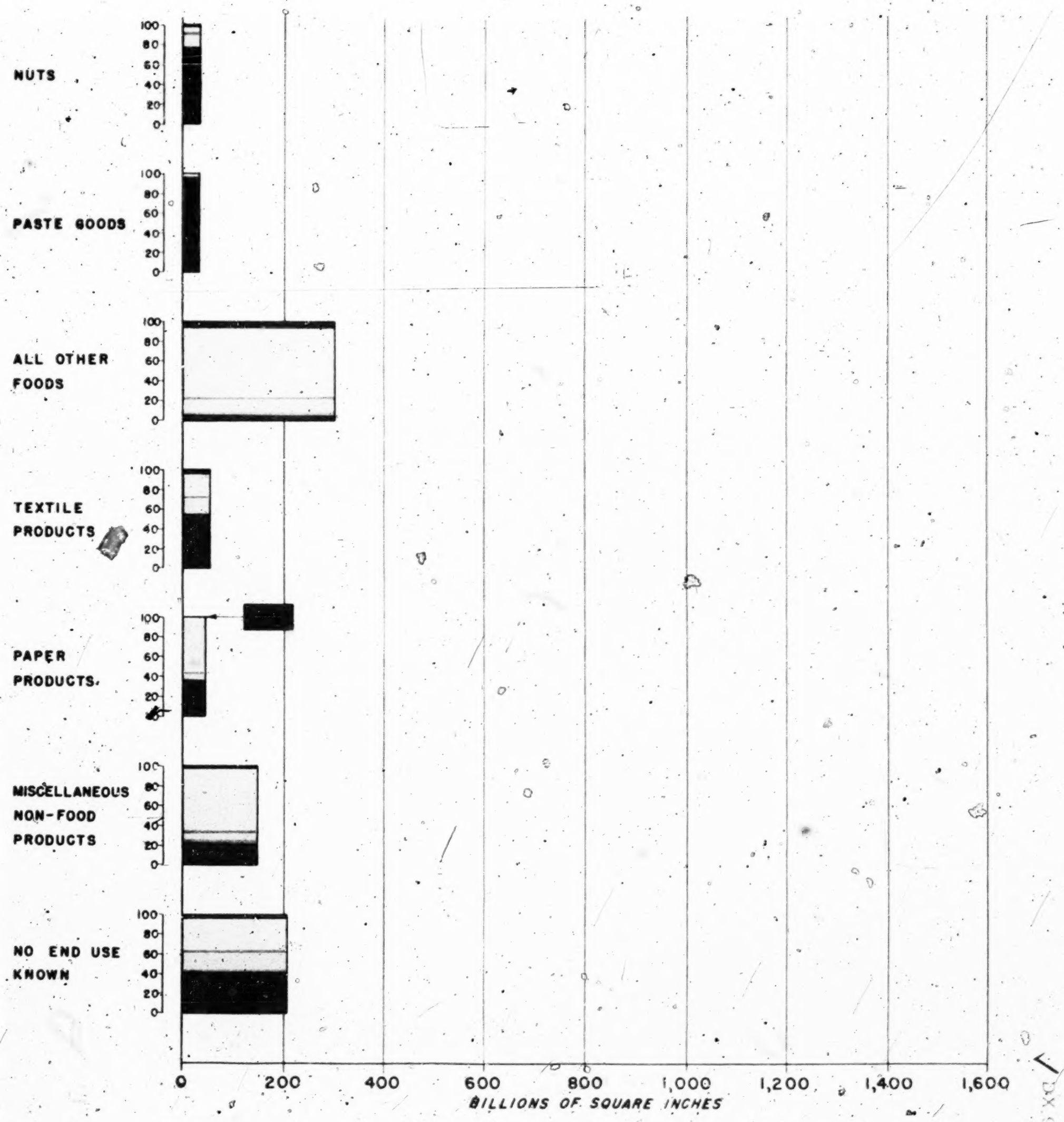
This space is provided for the convenience of participants who may wish to make notations of items to be rechecked or of questions which arise in the

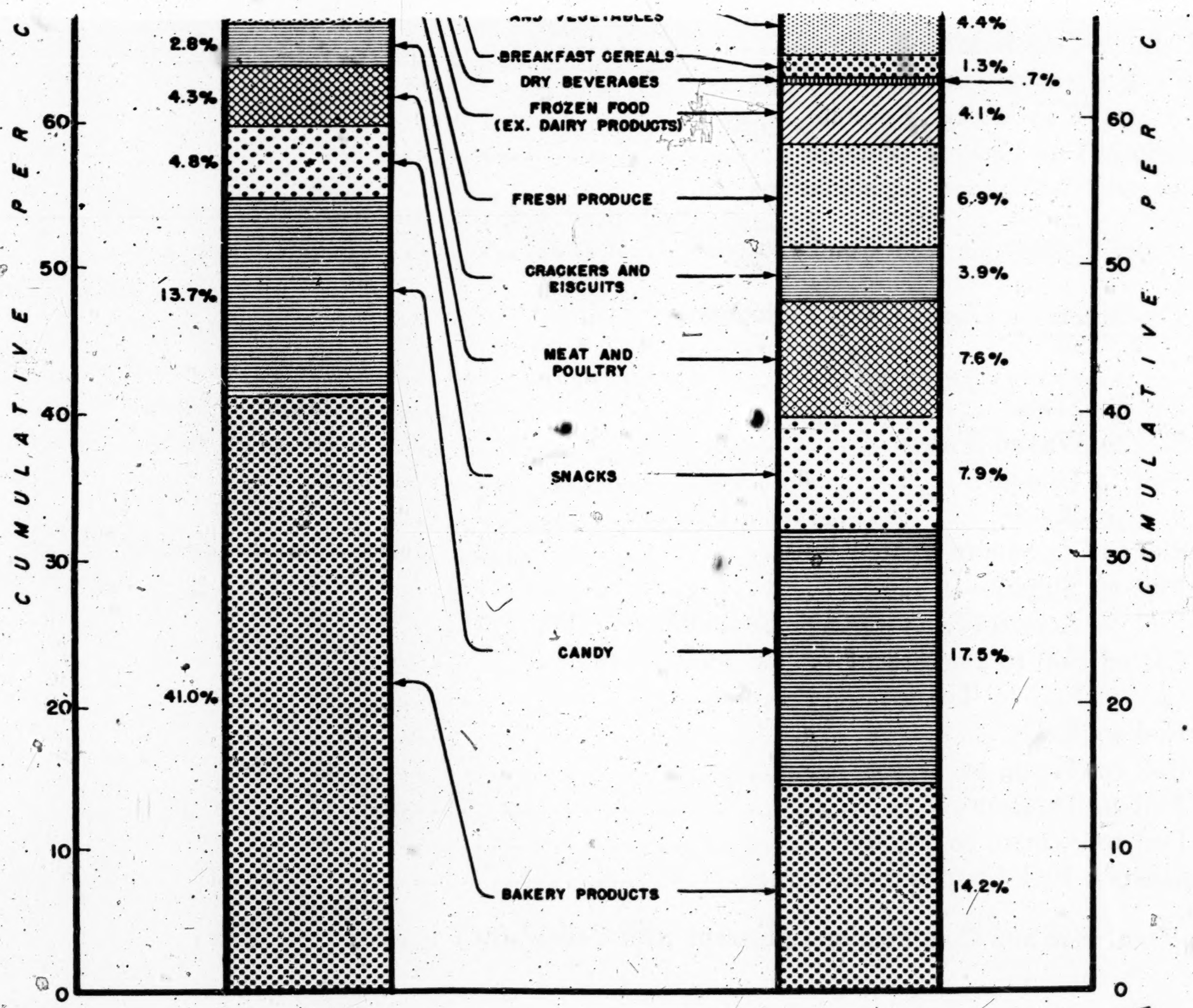
course of the work. Use this column also to show name of those customers who are themselves converters. Also indicate in this column any line on which the product recorded was sold to a jobber of packaging materials.

Conversion

The manner of using these columns will be determined for each participant in accordance with the form in which his records are kept and the manner in which the information is posted to these forms.

August 11, 1950


NUTS
PASTE GOODS
ALL OTHER FOODS
TEXTILE PRODUCTS
PAPER PRODUCTS.
MISCELLANEOUS NON-FOOD PRODUCTS
NO END USE KNOWN
100
80
60
40
20
0
0
200
400
600
800
1,000
1,200
1,400
1,600
BILLIONS OF SQUARE INCHES



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DX.987

IMPORTANCE OF PRINCIPAL MATERIALS IN CONVERTER STUDY

(Billions of Square Inches)
(Adjusted July 1951)

Cellophane and Combinations		
Cello MT	547	
Cello PT	88	
Duplex Cello MT	50	
Coated Cello, MT	31	
Cello MT & Glassine, Window Type	26	
Duplex Cello PT	15	
Cello MT & Kraft, Window Type	12	
Cello PT & Kraft, Window Type	5	
Lam. Cello MT	4	
Coated Lam. Cello MT	4	
Duplex Cello MT & Glassine	3	
Cello MT & Vellum, Paper Window Type	3	
Lam. Cello MT to Foil	2	
Lam. Cello MT to Kraft	2	
Cello PT & Greaseproof, Window Type	2	
Lam. Cello MT to Waxed Sulphite	2	
Lam. Cello MT to Opaque Glassine	1	
Miscellaneous Cellophane Combinations	4	
Total Cellophane and Combinations		801
Foil and Combinations (Except with Cellophane)		
Foil	128	
Lam. Foil to Tissue	23	
Lam. Foil to Waxed Tissue	14	
Lam. Foil to Glassine	11	
Lam. Foil to Bond	8	
Lam. Foil to Glassine to Coated Foil	7	
Lam. Foil to Sulphite	7	
Lam. Foil to Acetate	4	
Lam. Coated Foil to Parchment	4	
Lam. Coated Foil to Tissue	4	
Lam. Foil to Kraft	3	
Lam. Foil to Tissue to Tissue	3	
Lam. Foil to Parchment	1	
Lam. Foil to Acetate to Pliofilm	—	
Miscellaneous Foil Combinations	9	
Total Foil and Combinations (Except with Cellophane)		226

IMPORTANCE OF PRINCIPAL MATERIALS IN CONVERTER STUDY

(Billions of Square Inches)
(Adjusted July 1951)

Glassine and Combinations (Except with Cellophane or Foil)

Glassine	223	
Waxed Glassine	136	
Lam. Glassine	38	
Duplex Glassine & Kraft	38	
Duplex Glassine & Bleached Kraft	21	
Lam. Glassine to Kraft	20	
Duplex Waxed Glassine	13	
Coated Glassine	12	
Duplex Lam. Glassine & Bleached Kraft	8	
Duplex Glassine	6	
Duplex Lam. Glassine & Kraft	4	
Opaque Glassine	3	
Waxed Lam. Glassine	3	
Duplex Glassine & Sulphite	2	
Lam. Glassine to Opaque Sulphite	2	
Duplex Waxed Glassine & Sulphite	2	
Lam. Waxed Glassine & Sulphite	2	
Triplex Glassine & Kraft & Kraft	1	
Miscellaneous Glassine Combinations	2	
Total Glassine and Combinations (Except with Cellophane or Foil)		536

Films and Combinations (Except with Cellophane, Foil, Glassine, or Other Papers)

Pliofilm	29	
Polyethylene	10	
Cellulose Acetate	8	
Coated Pliofilm	4	
Visten 10	3	
Vinyl	1	
Lam. Pliofilm	1	
Miscellaneous Synthetic Films	1	
Total Synthetic Films and Combinations (Except with Cellophane, Foil, Glassine, or Other Papers)		57

IMPORTANCE OF PRINCIPAL MATERIALS IN CONVERTER STUDY

(Billions of Square Inches)
(Adjusted July 1951)

Papers and Combinations (Except with Cellophane, Foil, or Glassine)	
Waxed Bleached Sulphite	1,156
Waxed Opaque Sulphite	628
Waxed Kraft	130
Parchment	119
Sulphite	90
Kraft	48
Waxed Clear Transparent	30
Moldproofed Sulphite	26
Bleached Kraft	26
Kraft & Mesh, Window Type	25
Waxed Parchment	22
Waxed Twisting	18
Lam. Waxed Sulphite	14
Dry Waxed	11
Waxed Manila	10
Greaseproof	10
Duplex Kraft	10
Lam. Sulphite	10
Waxed Tissue	10
Duplex Kraft & Waxed Kraft	6
Waxed Opaque Twisting	4
Manila	3
Casein Coated Sulphite	3
Tissue	2
Duplex Wet Strength Kraft	2
Duplex Kraft & Asphalt Lam. Kraft	2
Duplex Kraft & Bleached Kraft	2
Coated Sulphite	2
Lam. Waxed Sulphite to Tissue	2
Waxed and Treated Sulphite	2
Lam. Waxed Manila	1
Triplex Kraft & Kraft & Kraft	1
Asphalt Lam. Sulphite	1
Waxed Bleached Kraft	1
Miscellaneous Papers	14
Total Other Papers and Combinations (Except with Cellophane, Foil, or Glassine)	2,441
TOTAL ALL MATERIALS	4,061

SOURCE: IBM recapitulation of records of 19 converters—1949.

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Chocolate or Chocolate Coated Candy

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT								X		X	X					X	X			5
Cellophane MT	X						X	X		X	X					X	X			7
Duplex—Cellophane PT and Cellophane PT							X													1
Duplex—Cellophane MT and Cellophane MT								X		X							X		X	4
Cellophane MT and Glassine, Window Type								X												1
Foil								X						X	X					3
Foil Laminated to Glassine														X						1
Foil Laminated to Sulphite								X						X						2
Foil Laminated to Tissue								X						X						2
Foil Laminated to Waxed Glassine												X								1
Foil Laminated to Waxed Greaseproof								X												1
Foil Laminated to Waxed Sulphite								X												1
Foil Laminated to Waxed Tissue								X							X					2
Foil Laminated to Waxed Tissue to Foil								X												1
Glassine	X	X		X	X			X		X	X				X	X				9
Duplex—Glassine and Sulphite																X				1
Duplex—Glassine and Tissue								X												1
Sulphite								X								X				2
Waxed Bleached Sulphite	X			X																2
Waxed Opaque Sulphite				X																1
Waxed and Treated Sulphite																			X	1
Duplex—Waxed Tissue and Twisting Tissue				X																1
Waxed Tissue Laminated to Tissue																			X	1
Sulphite Casein Coated								X												1

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Variety Bread

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT			X	X	X				X											4
Cellophane MT	X	X	X	X	X		X	X	X				X					X		10
Duplex—Cellophane MT and Cellophane MT				X																1
Cellophane MT and Glassine, Window Type				X																1
Cellophane MT and Sulphite, Window Type									X											1
Foil Laminated to Sulphite				X																1
Foil Laminated to Waxed Tissue				X																1
Foil Laminated to Tissue, Plus Coating				X																1
Glassine	X	X	X	X					X										X	6
Laminated Glassine									X											1
Waxed Glassine									X					X			X			3
Duplex—Glassine and Kraft									X											1
Triplex—Glassine and Kraft and Kraft	X																			1
Duplex—Glassine and Sulphite									X											1
Kraft									X								X			2
Sulphite				X					X								X		X	4
Opaque		X																		1
Waxed Kraft																	X			1
Waxed Manila																	X			1
Waxed Bleached Sulphite		X					X				X		X	X			X			6
Waxed Opaque Sulphite		X											X				X			3
Waxed Clear Transparent Sulphite													X				X			2
Dry Waxed Kraft									X											1
Pliofilm				X																1

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Cookies and Wafers

Material	Converter																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	15	14	15	16	17	18	19	
Cellophane PT								X			X						X			3
Cellophane MT		X		X	X		X	X	X		X				X	X	X			10
Duplex—Cellophane MT and Cellophane MT		X					X				X						X			4
Cellophane MT Laminated to Foil																	X			1
Cellophane MT and Glassine, Window Type																	X			1
Cellophane MT and Laminated Glassine, Window Type											X									1
Foil Laminated to Cellulose Acetate							X													1
Duplex—Foil Laminated to Glassine and Bleached Kraft																		X		1
Foil Laminated to Sulphite																	X			1
Foil Laminated to Tissue						X														1
Foil Laminated to Waxed Tissue						X											X			2
Glassine		X									X						X	X		4
Laminated Glassine											X						X			2
Duplex—Glassine and Kraft											X									1
Duplex—Laminated Glassine and Kraft																		X		1
Duplex—Laminated Glassine and Bleached Kraft																		X		1
Bleached Kraft																		X		1
Duplex—Kraft and Bleached Kraft																		X		1
Triplex—Kraft and Kraft and Kraft																		X		1
Waxed Bleached Sulphite													X							1
Waxed Opaque Sulphite									X											1
Dry Waxed Kraft																	X			1
Sulphite Casein Coated																	X			1
Polyethylene																	X			1

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MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Fresh Sausage

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT								X		X	X		X						X	5
Cellophane MT								X		X			X						X	4
Duplex—Cellophane PT and Cellophane PT								X												1
Duplex—Cellophane MT and Cellophane MT	X	X	X					X		X			X						X	7
Cellophane PT Laminated to Manila											X									1
Cellophane MT and Glassine, Window Type								X												1
Foil Laminated to Tissue										X										1
Glassine			X					X												2
Laminated Glassine			X			X														2
Duplex—Glassine and Kraft							X													1
Duplex—Laminated Glassine and Kraft							X													1
Glassine Laminated to Opaque Sulphite			X																	1
Waxed Glassine Laminated to Sulphite																	X			1
Parchment								X										X		2
Sulphite								X												1
Waxed Bleached Kraft																	X			1
Waxed Bleached Sulphite																	X	X		2
Cellulose Acetate								X												1
Pliofilm								X				X								2
Polyethylene										X										1

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Ham, Pork Shoulder Butts, and Slab Bacon

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT						X				X	X			X	X					5
Cellophane MT						X				X	X			X	X					5
Duplex—Cellophane MT and Cellophane MT															X					1
Triplex—Cellophane PT and Cellophane PT and Cellophane PT															X					1
Cellophane PT and Greaseproof, Window Type															X					1
Cellophane MT Laminated to Pliofilm															X					1
Foil					X															1
Foil Laminated to Sulphite															X					1
Foil Laminated to Tissue					X															1
Coated Glassine															X					1
Greaseproof			X																	1
Kraft			X																	1
Parchment			X												X					2
Waxed Kraft			X																	1
Oiled Paper			X																	1
Pliofilm										X	X				X					3

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Powdered Drink Mixes

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane MT		X						X								X			X	4
Duplex—Cellophane MT and Cellophane MT			X																	1
Foil Laminated to Glassine	X																			1
Foil Laminated to Waxed Glassine													X							1
Foil Laminated to Cellulose Acetate		X																	X	2
Glassine	X					X		X	X											4
Opaque Glassine									X											1
Laminated Glassine	X																			1
Duplex—Glassine and Kraft	X																			1
Duplex—Glassine and Bleached Kraft	X																			1
Duplex—Laminated Glassine and Kraft	X																			1
Duplex—Laminated Glassine and Bleached Kraft	X																			1
Kraft	X																			1
Bleached Kraft	X																			1
Sulphite									X											1
Laminated Kraft									X											1
Duplex—Kraft and Bleached Kraft	X																			1
Waxed Bleached Sulphite									X											1
Kraft Laminated to Polyethylene																			X	1
Laminated Pliofilm								X												1
Coated Pliofilm								X												1

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Dried Fruits (Dates, Figs, Raisins, Etc.)

Material	Converter																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT						X									X					2
Cellophane MT						X						X			X					3
Duplex—Cellophane MT and Cellophane MT												X								1
Cellophane MT and Glassine, Window Type						X														1
Foil Laminated to Bond																	X			1
Foil Laminated to Tissue to Tissue																	X			1
Foil Laminated to Tissue, Plus Coating						X														1
Glassine				X																1
Laminated Opaque Glassine												X								1
Duplex—Glassine and Kraft				X																1
Duplex—Glassine and Bleached Kraft				X																1
Duplex—Laminated Glassine and Kraft				X																1
Duplex—Laminated Glassine and Bleached Kraft				X																1
Laminated Glassine Laminated to Kraft				X																1
Kraft				X																1
Bleached Kraft				X																1
Sulphite																			X	1
Waxed Opaque Sulphite					X															1
Waxed Clear Transparent Sulphite					X															1
Cellulose Acetate						X						X	X							3
Pliofilm						X						X	X		X					4

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

END USE—CHEESE

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT	X												X				X			3
Cellophane MT	X	X	X				X			X			X				X			7
Laminated Cellophane MT												X					X			2
Cellophane MT, Coated												X					X			2
Laminated Cellophane MT, Coated												X					X			2
Cellophane MT and Laminated Glassine, Window Type																	X			1
Cellophane MT Laminated to Paper												X								1
Foil	X																X			2
Foil Laminated to Bond						X														1
Foil Laminated to Parchment						X														1
Foil Laminated to Sulphite																	X			1
Foil Laminated to Tissue						X						X								2
Foil Laminated to Waxed Tissue																	X			1
Foil, Coated						X											X			2
Coated Foil Laminated to Parchment						X														1
Coated Foil Laminated to Tissue						X														1
Glassine	X	X															X	X		4
Waxed Glassine												X								1
Duplex—Glassine and Kraft														X						1
Parchment							X									X		X		3
Sulphite																	X			1
Waxed Kraft																X				1
Waxed Parchment																X				1
Waxed Bleached Sulphite																X				1
Cellulose Acetate	X																			1
Pliofilm	X												X				X	X		4
Polyethylene													X				X			2
Laminated Pliofilm																	X			1

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MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Fresh Vegetables

MATERIAL	CONVERTER 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Cellophane PT	X								X							X	X			4
Cellophane MT	X		X	X	X	X	X		X	X		X	X			X	X			12
Duplex—Cellophane MT and Cellophane MT									X			X								2
Duplex—Cellophane PT and Cellophane MT					X															1
Cellophane PT and Kraft, Window Type	X																			1
Cellophane PT and Tissue, Window Type									X											1
Cellophane MT and Glassine, Window Type									X											1
Cellophane MT and Kraft, Window Type	X																			1
Triplex—Cellophane PT and Kraft and Kraft	X																			1
Cellophane MT Laminated to Cellulose Acetate									X											1
Foil																			X	1
Foil Laminated to Waxed Glassine											X					X				2
Glassine	X								X											2
Duplex—Glassine and Kraft												X								1
Kraft	X																			1
Sulphite										X	X									2
Duplex—Kraft and Kraft	X																			1
Duplex—Kraft and Waxed Kraft	X																			1
Waxed Kraft											X									1
Waxed Manila											X									1
Waxed Bleached Sulphite										X	X								X	3
Waxed Opaque Sulphite											X									1
Kraft and Mesh, Window Type	X																			1
Cellulose Acetate					X	X			X	X							X			5
Laminated Cellulose Acetate									X											1
Pliofilm					X		X													2

2042

5624

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Potato Chips

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane MT			X		X	X	X	X	X	X	X		X	X	X				X	12
Duplex—Cellophane MT and Cellophane MT			X				X	X			X		X		X	X				7
Duplex—Cellophane MT and Glassine								X								X				2
Foil								X												1
Foil Laminated to Glassine											X	X				X				3
Foil Laminated to Suiphite											X									1
Foil Laminated to Tissue Plus Coating											X									1
Glassine					X	X		X			X				X	X		X		7
Duplex—Glassine											X					X				2
Laminated Glassine					X										X	X				3
Waxed Glassine						X		X					X			X	X	X		6
Waxed Laminated Glassine						X					X									2
Duplex—Waxed Glassine																X		X		2
Duplex—Waxed Glassine and Glassine																X				1
Glassine Laminated to Waxed Glassine																X				1
Duplex—Glassine and Kraft																X				1
Kraft											X				X	X				3
Waxed Kraft						X														1
Waxed Bleached Sulphite	X		X						X									X		4
Waxed Tissue Laminated to Tissue			X																	1
Pliofilm											X									1
Polyethylene													X							1

Source: IBM Recapitulation of records of 19 Converters—1949

Comparison of du Pont Cellophane and Waxed Paper for the Packaging of Baked Goods[1] for the year 1949

	Thousands of pounds	Per cent of combined
Du Pont Cellophane	40,081	13.7
Waxed Paper	253,386	86.3
Combined	293,467	100.0

	Millions of square inches[2]	Per cent of combined
Du Pont Cellophane	781,580	20.0
Waxed Paper	3,127,543	80.0
Combined	3,909,123	100.0

NOTE:

[1]Excludes Biscuits and Crackers.

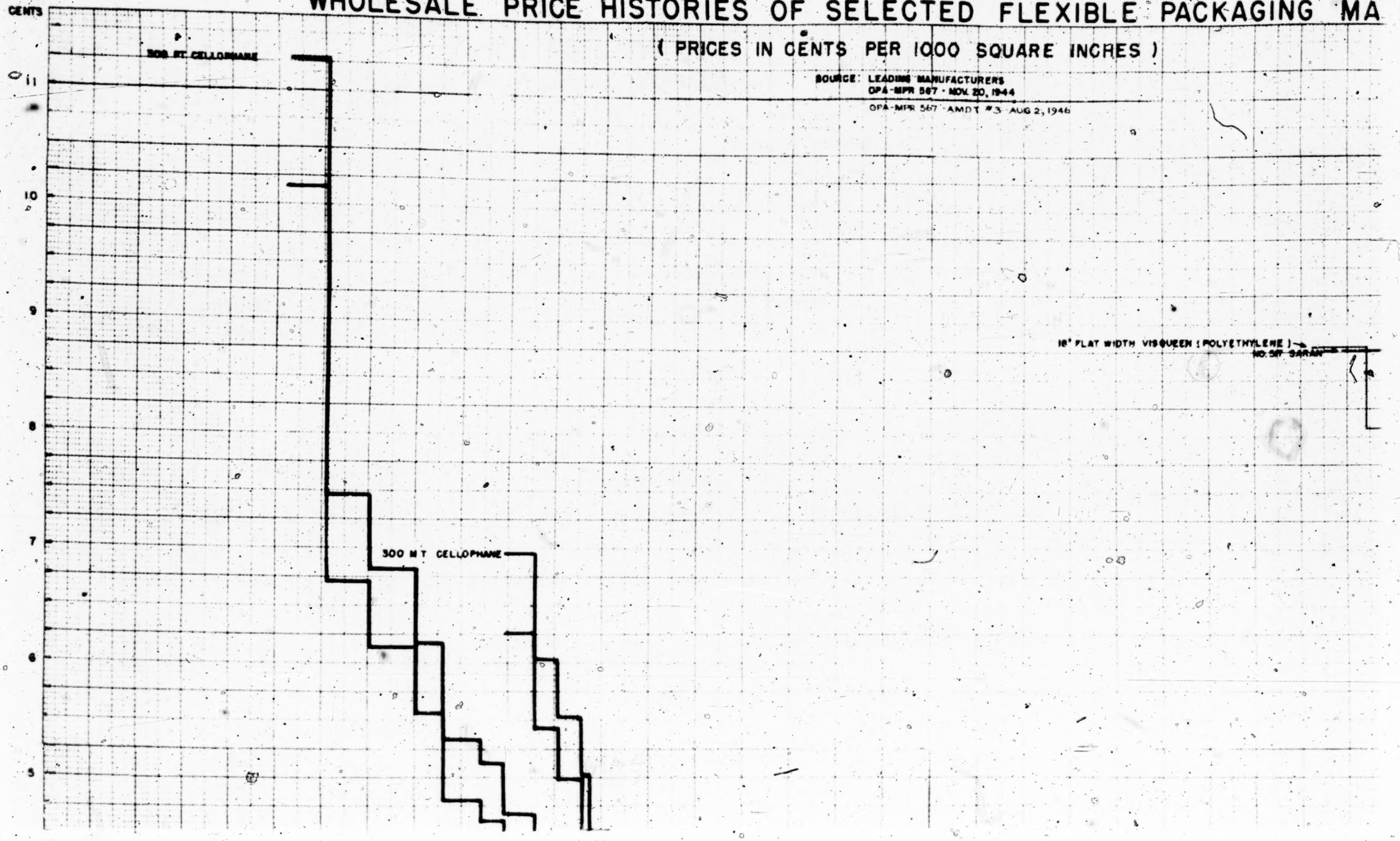
[2]Conversion to square inches made on following basis:
Cellophane—300 gauge
Waxed Paper—35# waxed weight for 500 sheets 24x36.

Sources: Du Pont trade analysis records, Film Department; Consolidated Industry Report, Statistical Program of the Waxed Paper Institute, Inc., Chicago, Ill.—compiled by Ernst & Ernst, Certified Public Accountants.

WHOLESALE PRICE HISTORIES OF SELECTED FLEXIBLE PACKAGING MA

(PRICES IN CENTS PER 1000 SQUARE INCHES)

SOURCE: LEADING MANUFACTURERS
OPA-MPR 567 - NOV. 20, 1944
OPA-MPR 567 - AMDT #3 - AUG 2, 1946



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PRICE HISTORIES OF SELECTED FLEXIBLE PACKAGING MATERIALS

(PRICES IN CENTS PER 1000 SQUARE INCHES)

SOURCE: LEADING MANUFACTURERS
OPA-MPR 567 - NOV. 20, 1944
OPA-M PR 567 - AMDT #3 - AUG 2, 1946

CENTS

11

10

9

8

7

6

5

18" FLAT WIDTH VISQUEEN (POLYETHYLENE)→
NO. 517 SARAN

PHANE

NO 517 SARAN

18" FLAT WIDTH VISQUEEN (POLYETHYLENE)

DX. 990

Comparison of Cellophane and All Types of Wrapping Paper Required by 17 Large Meat Packers for the year 1951

	Pounds	Per cent of total
Cellophane	6,378,725	11.4
All Types of Paper	49,520,647	88.6
Total	55,899,372	100.0

Source: Tabulation of returns by 17 members of American Meat Institute in answer to questionnaire issued by the Institute at the request of the National Production Authority.

DX. 991

Comparison of Cellophane, Glassine, and Waxed Paper
Used by 115 Confectionery Manufacturers
in 1950

	Pounds	Per cent of total
Cellophane	7,260,467	24.4
Glassine	10,973,454	37.0
Waxed Paper	11,455,756	38.6
Total	29,689,677	100.0

	Millions of Square Inches	Per cent of total
Cellophane	141,579	26.8
Glassine	189,621	35.8
Waxed Paper	197,955	37.4
Total	529,155	100.0

Source: Tabulation of returns by 115 members of National Confectioners' Association of the U. S., Inc., in answer to questionnaire issued by the Association at the request of the National Production Authority.

Note: Conversion to square inches made on following basis:
Cellophane — 300 gauge
Glassine — 25# basis weight for 500 sheets 24 x 36
Waxed Paper — 25# waxed weight for 500 sheets 24 x 36.

DX.992

Comparison of Cellophane, Glassine, and Waxed Paper Used by Two Large Bakers for Wrapping Bakery Products in the year 1949

	Millions of Square Inches	Per cent of total
For Wrapping Bread		
Waxed Sulphite	330,545	82.5
Glassine	16,214	4.1
Cellophane	53,800	13.4
Total	400,559	100.0
For Wrapping All Bakery Products		
Waxed Sulphite	330,578	73.3
Glassine	19,338	4.3
Cellophane	100,778	22.4
Total	450,694	100.0

Source: Annual summary of purchases prepared in the regular course of business by Continental Baking Company; Summary of Inventory and Use record of General Baking Company.

DX.993

Comparison of Cellophane and Paper Required for Overwraps and Liners for Retail Packages of Frozen Foods for the year 1951

	Thousands of pounds	Per cent of combined
Cellophane	1,978	29.8
Paper	4,650	70.2
Combined	6,628	100.0

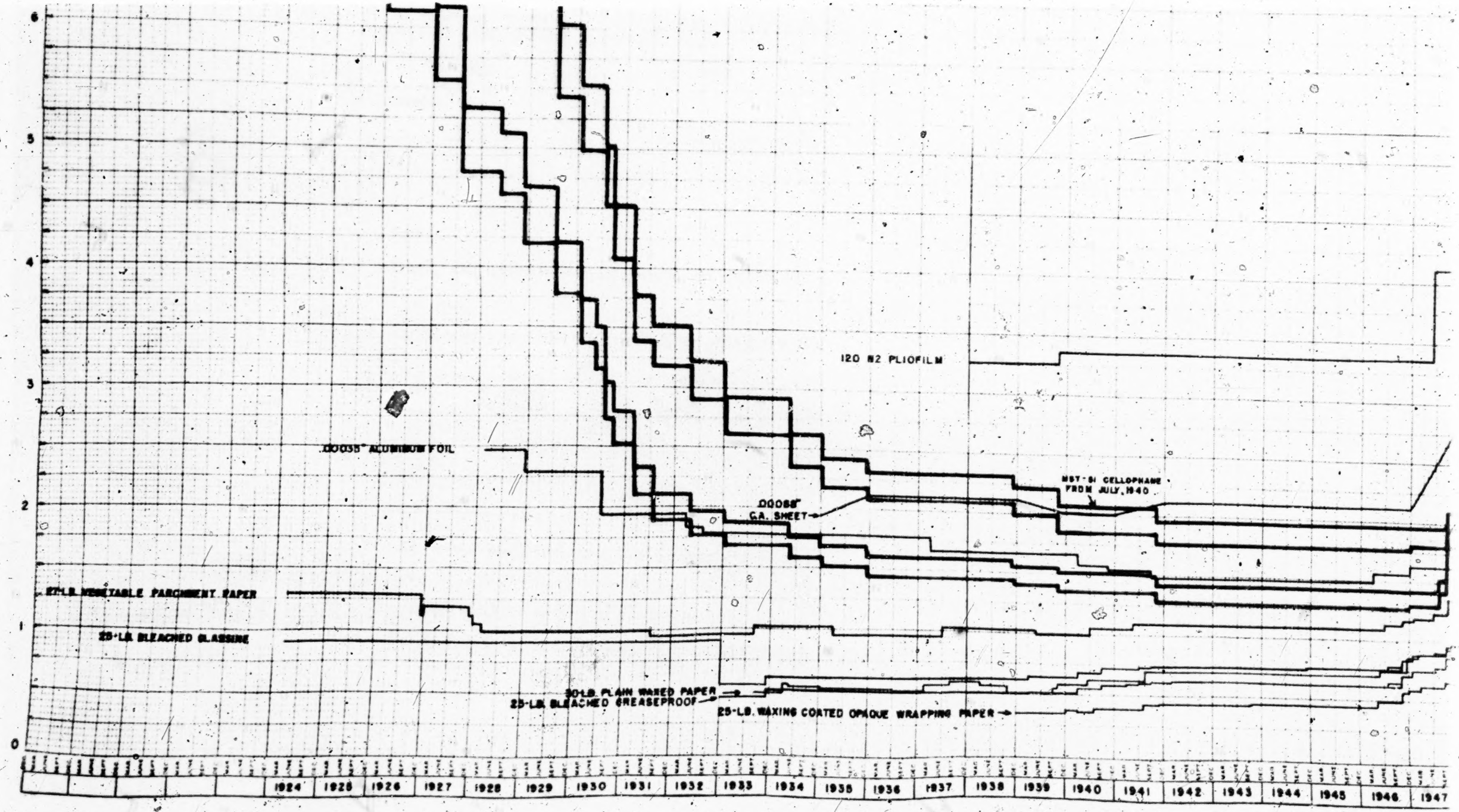
	Millions of Square Inches	Per cent of combined
Cellophane	38,571	36.5
Paper	66,960	63.5
Combined	105,531	100.0

Note:

Conversion to square inches made on following basis:
Cellophane — 300 gauge
Paper — 30# unwaxed weight for 500 sheets 24 x 36.

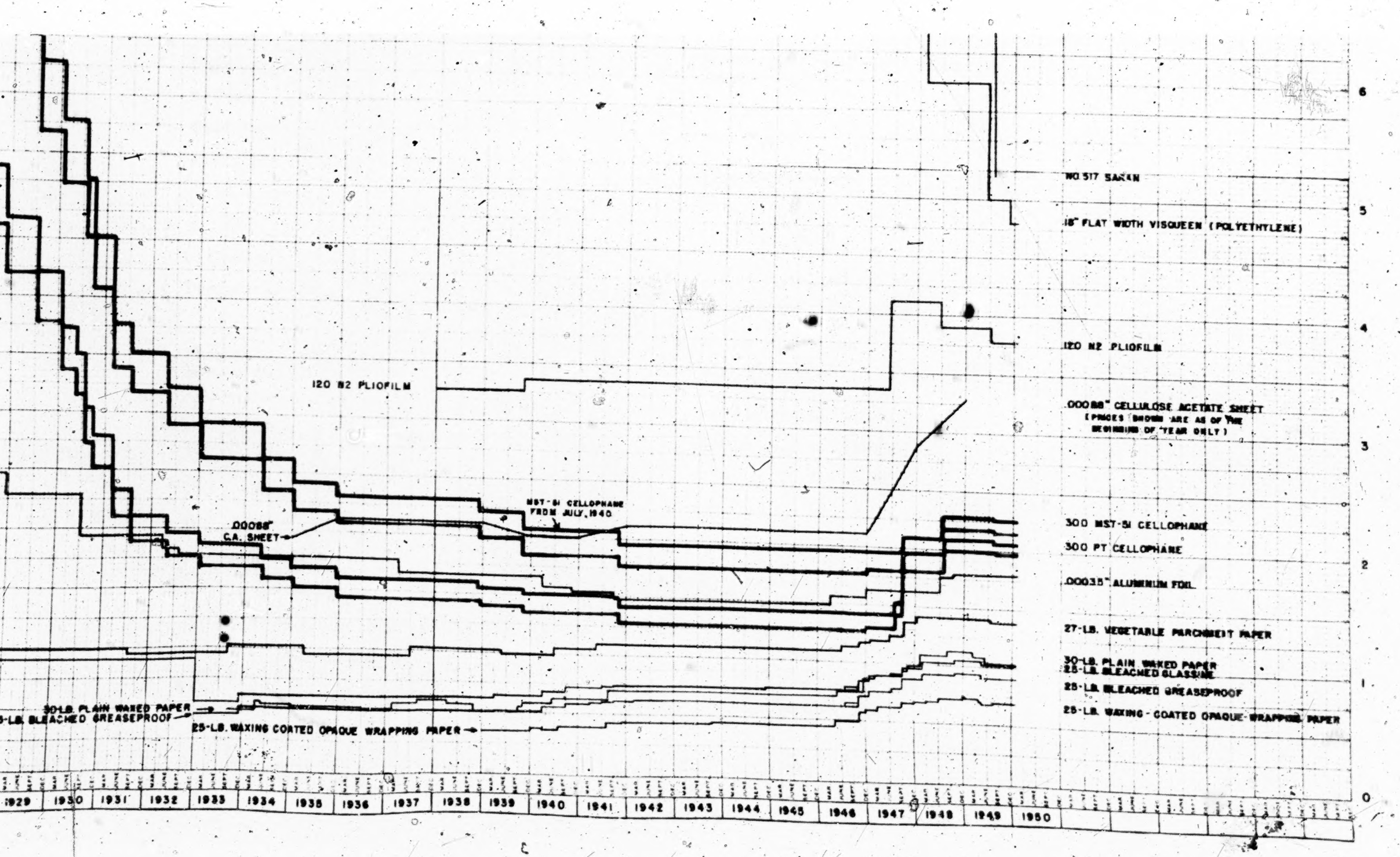
Source:

Data supplied to Production and Marketing Administration, U. S. Department of Agriculture, by the National Association of Frozen Food Packers.



120 #2 PLIOFILM
.00035" ALUMINUM FOIL
.00088" C.A. SHEET
MST-51 CELLOPHANE FROM JULY, 1940
27-LB. VEGETABLE PARCHMENT PAPER
25-LB. BLEACHED GLASSINE
30-LB. PLAIN WAXED PAPER
25-LB. BLEACHED GREASEPROOF
25-LB. WAXING COATED OPAQUE WRAPPING PAPER
0
1
2
3
4
5
6
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947

2048



343342 O - 55 - vol 8

✓ #994 A

FLEXIBLE WRAPPING MATERIALS
PRICE STUDIES
COMMODITY SPECIFICATION INFORMATION

Wrapping Material .....

Code No. .....

1. a. Company name .....
   b. Address .....
   c. Information authorised by ..... Title .....
   d. Data prepared by ..... Position .....
2. Description of wrapping material:
   a. Commodity ..... d. Area factor (i.e. sq. in. per lb.) .....
   b. Grade ..... e. Brand name (if any) .....
   c. Basis weight ..... f. Additional .....
3. a. Price quoted is to .....
   Customary class of purchaser
   b. Type of quotation: (1) List price ..... (2) Actual transaction price ..... (3) Other (specify) .....
   c. Unit quoted .....
   d. Minimum and maximum quantity to which price applies .....
   e. Customary delivery period .....
4. Discounts applicable to prices of wrapping material sold to customary class of purchaser. (Circle discounts which have been deducted in arriving at prices at which product is normally sold)
   a. Trade ..... b. Quantity ..... c. Cash ..... d. Other .....
5. Usual method of effecting price changes:
   a. Change in list price ..... b. Change in discounts .....
   c. Other (explain) .....
6. a. Delivery terms (f.o.b., etc.) .....
   b. Usual means of delivery (carrier) .....
7. Does price at which product is normally sold include charge or deposit for packaging? (explain) .....
   .....
8. Channels of distribution, percentage of sales made, discounts and other allowances by type of distribution for wrapping material described in No. 2 above.

Sales and Discounts	Other Manufacturer or Converter	Wholesale Distributor	Retailer	Consumer	Other—(Specify)
a. Sales (%)					
b. Cash Discount					
c. Trade Discount					
d. Quantity Discount					

9. Market area served .....
10. Method of selling (i.e., salesman, catalog, etc.) .....
11. Prices of wrapping material described in 2, 3, 4. (Use Commodity Price Information sheets attached)

Date .....

994-A

FLEXIBLE WRAPPING MATERIALS.
PRICE STUDIES
COMMODITY PRICE INFORMATION

Wrapping Material .....

Code No. 6 .....

1. Company name .....

2. Wrapping material: (If there has been any change in specifications, please indicate in "Remarks" column the (1) date of change (2) nature of change, and (3) how much of a price change, if any, between the old and new wrapping material was due to change in specification) .....

3. Please enter below prices for wrapping material described in 2, 3, and 4 of Commodity Specification Information sheet.

YEAR	PRICES	REMARKS (List changes in specifications and dates of price changes)
1950		
1949		
1948		
1947		
1946		
1945		
1944		
1943		
1942		
1941		
1940		
1939		
1938		
1937		
1936		
1935		
1934		
1933		
1932		
1931		
1930		
1929		
1928		
1927		
1926		
1925		
1924		
1923		

a. Data prepared by ..... Position .....

b. Data checked by ..... Position .....

Date .....

2051

5633

V D.Ex 994B

WHOLESALE PRICE HISTORIES OF SELECTED FLEXIBLE PACKAGING MATERIALS

Company	Material	Class of Purchaser	Quantity Bracket
Marathon Corporation	30# Waxed Paper	User	10M - 25M Pounds
Consolidated Water Power and Paper Company	25# Waxing Coated Opaque Wrapping Paper	Converter	10M Pounds and Over
Riegel Paper Corporation and MPR567, Nov. 20, 1944 and MPR567, Amdt. No. 3, Aug. 2, 1946	25# Bleached Glassine	All Customers	500 Pounds and Over
Riegel Paper Corporation and MPR567, Nov. 20, 1944 and MPR567, Amdt. No. 3, Aug. 2, 1946	25# Bleached Greaseproof	All Customers	500 Pounds and Over
Paterson Parchment Paper Company	27# Vegetable Parchment	Jobbers and Converters	500 Pounds and Over
Aluminum Company of America	.00035 in. Aluminum Foil	Converter	30M Pounds and Over
E. I. du Pont de Nemours and Company, Inc.	300 PT Cellophane	User	500 Pounds and Over
E. I. du Pont de Nemours and Company, Inc.	300 MSB51 Cellophane	User	500 Pounds and Over
Eastman Kodak Company	.00088 in. Cellulose Acetate	Principal Customers	All Orders
Goodyear Tire and Rubber Company	120N2 Pliofilm	Converter	10M Pounds and Over
Visking Corporation	18 in. Flat Width Visqueen (Polyethylene)	User	10M Pounds and Over.
Dow Chemical Company	#517 Saran	User	Minimum Price

10/30/51

DX.995

WHOLESALE PRICES OF SELECTED FLEXIBLE PACKAGING MATERIALS

1949 Average Prices

Packaging Material	Price per 1,000 sq. in. (cents)	Price per pound (cents)	Yield per pound (sq. in.)
Plain Waxing Sulphite 25# coated Opaque	.7	11.9	17,280
Plain Waxed Sulphite 30# Self-Sealing	~~1.0~~ 1.1	~~15.0~~	14,400
Bleached Glassine 25#	1.0	17.8	17,280
Bleached Greaseproof 25#	.9	15.8	17,280
Vegetable Parchment 27#	1.4	22.3	16,000
Aluminum Foil .00035"	1.8	52.2	29,200
Plain Cellophane 300 PT	2.1	44.8	21,500
Moistureproof Cellophane 300 MST-51	2.3	47.8	21,000
Cellulose Acetate .00088"	3.3	82.0	25,000
Pliofilm 120 Gauge N 2	3.8	80.8	21,000
Polyethylene .002"—18" Flat Width	5.4	81.0	15,000
Saran 100 Gauge #517	6.1	99.0	16,300
Cry-O-Rap	Sold only in converted form. No unconverted quotations.		

Sources: Quotations of leading manufacturers.

Copy ✓ Dx. 997

Aluminum Company of America Ca 1216

Pittsburgh 19, Pa.

November 10, 49

Mr. W. S. Egekvist
Robert Heller & Associates
1568 Union Commerce Building
Cleveland, Ohio

Dear Mr. Egekvist:

In line with our conversation, I am listing below our production of aluminum foil for the years 1938 to 1949, inclusive.

It is understood these figures are to be treated in a confidential manner other than for the purpose intended.

Year	Tonnage
1938	5,275,604#
1939	6,956,075
1940	7,630,720
1941	3,421,181
1942	803,934
1943	3,228,238
1944	12,299,373
1945	14,562,623
1946	12,248,822
1947	11,254,083
1948	14,486,297
1949	11,989,679

Average yield per pound approximately 20,000 square inches.

Very truly yours

ALUMINUM COMPANY OF AMERICA

T. A. Torrence,
Manager, Foil

TAT:MEK

IN THE

UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

Civil Action No. 1216

OFFER OF PROOF NO. 1

ON BEHALF OF DEFENDANT DU PONT

May 29, 1951

United States v. du Pont
(Cellophane)

OFFER OF PROOF NO. 1 ON BEHALF OF
DEFENDANT DU PONT

In accordance with paragraph 2 of Supplemental Pretrial Order No. 2, dated October 11, 1950, du Pont submits herewith a written offer of proof on the subject of competition between cellophane* and other flexible packaging materials.

Du Pont offers to prove by evidence already admitted and by further competent and trustworthy documentary and oral evidence each and all of the facts set forth below.

All of the facts presented in this offer are applicable to and typical of conditions pertaining to the sale and use of flexible packaging materials at the present time and as of 1949 and prior years.

I. Facts as to Selection of Packaging Materials

Many different types of goods are sold to the consumer packaged in units of convenient size. The producer, wholesaler and retailers decide the types of packaging to be used, that is whether the package is to be of specific rigid

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* Throughout this offer of proof, the term "cellophane" comprehends both moistureproof and plain cellophane unless otherwise indicated. Cellophane, for purposes of this offer, is defined as a self-sustaining film of regenerated cellulose.

materials, specific flexible packaging materials, or a combination of rigid and flexible packaging materials.

There are many self-sustaining thin sheets which are usable interchangeably as flexible packaging materials. The selection of a specific flexible material or combination of materials for the packaging of a particular product is made on the basis of the commercial, technical and economic considerations applicable to the merchandising and use of the particular product to be packaged.

II. Facts About Cellophane

A. Cellophane as a Flexible Packaging Material

Cellophane is a flexible packaging material. About 95% of du Pont's cellophane is sold for packaging uses. This has been the case since du Pont started cellophane manufacture, as shown by the following table analyzing sales for representative years indicated:

DU PONT CELLOPHANE
(Figures are Pounds)

Year	Total Sales Including Export	Total Packaging	Total Non-Packaging	% of Packaging to Total Sales Including Export	% of Packaging to Total Sales Excluding Export
1924	521,074	505,402	15,672	96.95%	96.99%
1930	12,629,557	12,142,557	487,000	96.15%	96.10%
1935	43,427,449	42,252,449	1,175,000	97.30%	97.21%
1940	81,658,980	78,395,504	3,263,476	96.01%	95.52%
1946	106,375,801	100,275,498	6,100,303	94.27%	94.02%

B. Types of Cellophane

Du Pont sells over fifty varieties of cellophane, almost all developed to serve specific packaging uses. The development of specific types of cellophane was intended to enable cellophane to compete more effectively with other packaging materials, and has had that effect. Special films were developed, for example, to wrap fresh meats and frozen foods where meat juices or water would cause the moisture-proof coating then available to slough off, to wrap products such as tomatoes and spinach which will rot unless the package permits the discharge of gases and some degree of moisture, to wrap products in a way that would filter out ultraviolet rays which cause rancidity of certain products, to wrap sticky products, and to meet different commercial and climatic conditions.

When du Pont cellophane was first sold in 1924 users were packaging goods in other flexible packaging materials. Those materials were available to the trade in substantial quantities at very low prices and were well entrenched in the packaging market. The thrust of du Pont's effort to develop the manufacture and sale of cellophane has been to promote it as a packaging material, and to enable cellophane to replace and to compete with packaging materials which dominated the market in 1924, dominated it in 1947, and dominate it still.

Cellophane's initial disadvantages included shrinking in response to changing humidity, lack of resistance to tearing, high cost relative to other materials, fragility particularly under certain climatic conditions, unsuitability for use with existing printing and adhesive mediums, and unsuitability for use on existing packaging machinery. Initial advantages included novelty, increased visibility of the wrapped product, greaseproofness, and sales appeal.

Du Pont sought by technical research, market surveys and developmental selling to reduce or eliminate each factor that hindered sales to an important end use, and to emphasize such existing characteristics of cellophane and develop such new characteristics as would further sales to important end uses. To determine what the important end uses might be, du Pont undertook extensive studies of the potential volume for specific uses and the characteristics essential to adoption of cellophane for the use. In numerous cases, this study led to the discovery of entirely new uses, such as the individual packaging by the grower of units of fresh produce, prior to shipment from the growing area.

Correspondingly, manufacturers of other flexible packaging materials have endeavored to improve their products and stimulate increased usage. These forces, coupled with the trend on the part of users to impose more and more exacting

become saturated and gelatinous in texture. The resulting product is translucent and highly resistant to oil and grease.

5. Glassine is produced by finishing greaseproof paper between highly polished metal rollers (super calenders) under heat and at great pressure. This process develops the considerable transparency and surface gloss which are characteristic of glassine. It is inherently greaseproof, and can be sealed by heat, if coated. It is frequently made moistureproof by coating with appropriate lacquers or waxes and may be printed readily. Glassine and waxed paper are the two materials which have been sold in the largest quantities in direct competition with cellophane for the longest period of time.

6. Pliofilm is the trade name of a film produced by the flowing of a solvent solution of rubber hydrochloride onto a moving web. The web passes through a heated chamber, which evaporates the solvent and leaves a clear, transparent film. Pliofilm is extremely tough, can be stretched to 5 or 6 times its original dimensions, is inherently moistureproof, and is capable of weld-type heat sealing. Heavier gauges are slightly cloudy. It can be shrunk tightly around an object by application of moderate heat, and can be printed.

standards have resulted in ever-increasing competitive activity among the various producers of flexible packaging materials. In turn, this activity has resulted in increased comparability of characteristics among the materials.

The development of moistureproof cellophane was a major step in enabling du Pont to compete effectively with other flexible packaging materials. Sales and uses of plain cellophane were limited by its inability to resist the passage of moisture vapor. Plain cellophane has little more resistance to the passage of moisture vapor than ordinary newsprint.

An enormous increase of packaging was occurring in the food industry, particularly baking and candy. The cigar industry also offered a promising market. Cellophane, however, was practically precluded from these markets, because it lacked moistureproofness. Food products with essential moisture content, like cake, quickly lost their moisture to the atmosphere and dried out when wrapped in plain cellophane. Crisp food products like crackers, or hard candies, absorbed moisture from the atmosphere and became soggy or sticky. In contrast, competitive flexible packaging materials -- waxed paper, waxed glassine, and metal foil -- provided a substantial degree of protection against moisture gain or loss. Plain cellophane could not compete with waxed paper or waxed glassine in the packaging of bread and cake, or with metal foil in the cigar industry. Plain cellophane tried, without success, to displace glassine as a wrap for cigarettes.

To overcome this competitive disadvantage, a research project was set up by du Pont in 1924, having as its purpose the development of a film which would prevent passage of moisture vapor at least as well as the best waxed paper.

This research bore fruit with the invention, and subsequent patenting in 1929, of moistureproof cellophane. This product eliminated a basic disadvantage of plain cellophane for protective packaging and enabled du Pont to penetrate markets previously closed to it. Today approximately 90% of du Pont cellophane is moistureproof.

The following chart (Chart 1, Offer No. 1) traces the growth of du Pont cellophane production by major types and demonstrates the overwhelming importance of various types of moistureproof cellophane in this development. Each type is tailored to compete with other materials in specific areas of the market:

7. Polyethylene film is made from a solution formed from high-pressure polymerization of ethylene gas. This solution can be cast, calendered or extruded to produce the film. Principal characteristics of the film are chemical inertness, flexibility even at low temperatures, and good inherent moistureproofness. Polyethylene film is fairly transparent, but slightly hazy.

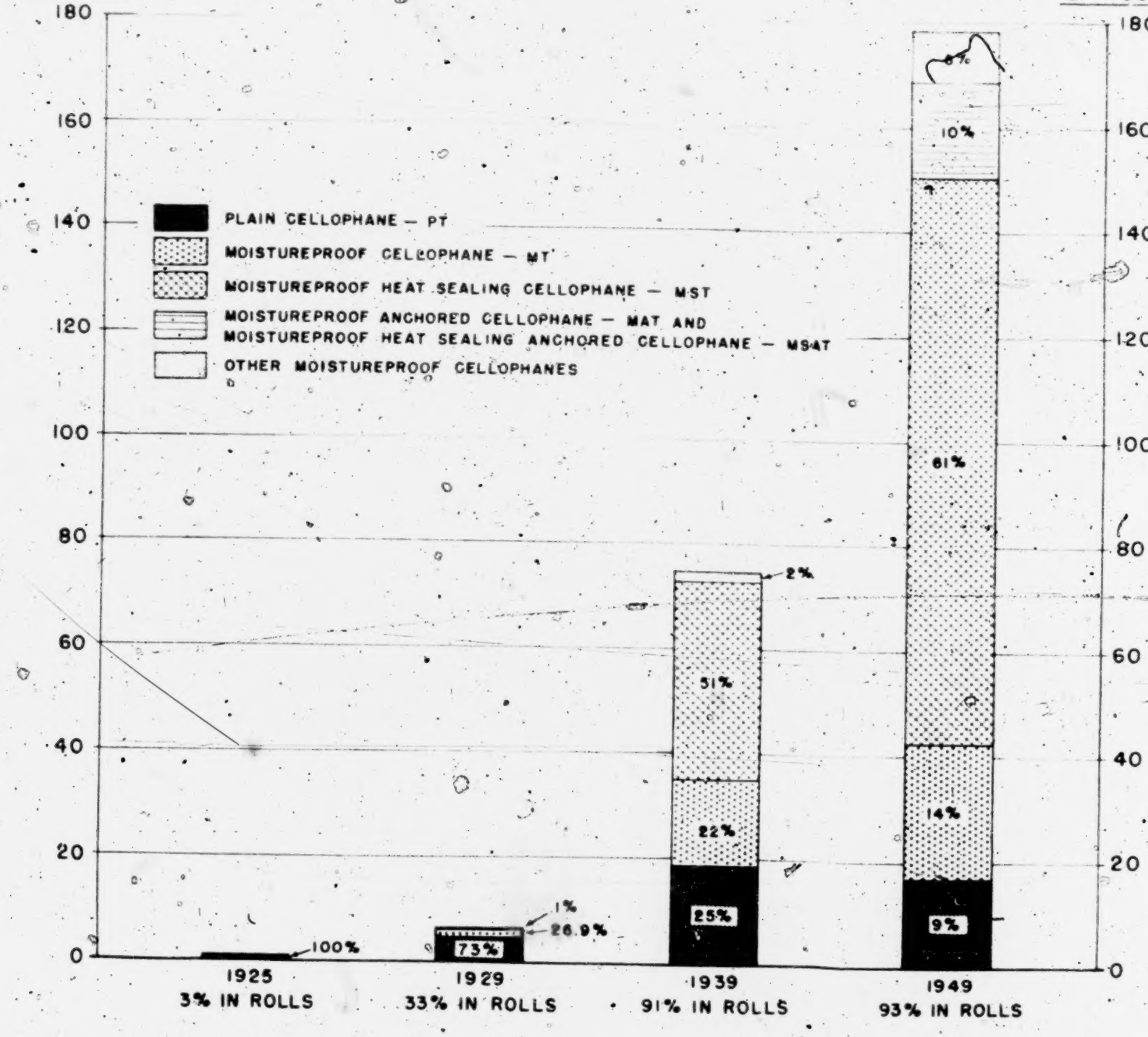
8. Saran is the trade name of a film made from polyvinylidene chloride. It is characterized by strength, toughness, flexibility, extreme transparency, and chemical inertness. It has the highest moistureproofness of all the packaging materials under discussion.

9. Sulphite Paper is high grade, machine-finished or machine-glazed paper used largely as wrapping or bag paper, for the packaging of food and other merchandise. It is the usual basis of wrappers (e.g., paper component of cigarette pack), waxing stock (for waxed paper) and other uses where moderate strength, flexibility and good coating and printing surface is required.

10. Vegetable Parchment is made by passing unsized raw paper (waterleaf) through a sulphuric acid bath, and drying on regular paper machine dryers. This "parchmentizing" covers the paper with a thin layer of gelatinous cellulose which fills

Chart 1, Offer No. 1

DU PONT CELLOPHANE PRODUCTION BY TYPES 1925, 1929, 1939 AND 1949



the interstices of the fibres and cements them into a cohesive mass. Vegetable parchment is highly greaseproof, has great wet strength, and is slightly translucent.

11. Waxed Paper (over 18 lbs. base stock*) is made by applying melted wax to sulphite or sulphate paper. In some cases the wax is pressed into the paper between rollers. Waxed paper is made in various degrees of transparency, and is inherently sealable by heat. Resins and other materials are frequently added to the wax to enhance surface gloss, heat-sealing properties and low-temperature flexibility. In the printed forms, print is usually applied prior to waxing.

These flexible packaging materials, like cellophane, are sold either directly to the ultimate user, or to converters for printing and processing into various types of wraps.

C. Samples

Samples of each of the eleven flexible packaging materials described above appear mounted on the following sheets numbered 14 and 14A-14L, inclusive.

---

* Over 18 lbs. to a ream of 480 sheets of 24 x 36 inches.

14 Aluminum Foil (Coated) *sample omitted* 2079

14A Aluminum Foil (Uncoated) *sample omitted* 2080

14B Cellulose Acetate *sample omitted* 2081

14C Cry-O-Rap *sample omitted* 2082

14D Glassine *sample omitted* 2083

14E Glassine (Waxed) *sample omitted* 2084

14F Greaseproof Paper (Bleached) *sample omitted* 2085

14G Pliofilm *sample omitted* 2086

14H Polyethylene *sample omitted* 2087

14I Saran *sample omitted* 2088

14J Sulphite *sample omitted* 2089

14K Vegetable Parchment *sample omitted* 2090

14L Waxed Paper *sample omitted* 2091

The following tabulation (Table 1, Offer No. 1) provides the basis of the preceding chart:

2069

5644

Appendix A to this offer of proof contains representative samples of cellophane and other flexible packaging materials in converted form. These show visually competing wraps made of the different materials for the same end uses. The ten end uses illustrated use substantial quantities of flexible packaging materials.

D. Manufacturers

Flexible packaging materials are made by substantial concerns which have been in business for many years. The names of the principal competitors of du Pont in the manufacture of competing flexible packaging materials appear on the following schedule which shows the date that each company was organized, the material or materials it manufactures, and its total assets and sales as of 1949. Sales figures are not those for the material named, but are company-wide totals, and are intended merely as an indication of the size of each company:

Table 1, Offer No. 1

1

DU PONT CELLOPHANE PRODUCTION BY TYPES

1925, 1929, 1939, 1949

1925

	Thousands of Pounds		Per Cent of Total
Plain Cellophane:			
Plain Transparent & Colored (PT)	941		
Plain Transparent & Colored—Embossing (PET)	3		
Total Plain Cellophane		944	100.0
Total All Cellophane		944	100.0

1929

Plain Cellophane:			
Plain Transparent & Colored (PT)	4,410		
Plain Transparent & Colored (PET)	14		
Total Plain Cellophane		4,424	73.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	1,626		
Total Moistureproof		1,626	26.9
Other Moistureproof Cellophanes:			
Moistureproof Anchored Transparent (MAT)	4		
Less—Moistureproof Transparent & Colored (LT)	2		
Total Other Moistureproof Cellophanes		6	.1
Total All Cellophanes		6,056	100.0

1939

Plain Cellophane:			
Plain Transparent & Colored (PT)	16,224		
Plain Transparent & Colored—Embossing (PET)	70		
Plain Opaque & Colored Opaque (PO)	14		
Plain Rancidity Retardant—Colored (PRC)	309		
Plain Transparent & Colored—High Humidity Use (PHT)	903		
Plain Transparent—Unsized (PUT)	950		
Plain—Flame Resistant T&C (PJT)	38		
Total Plain Cellophane		18,508	25.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	15,707		
Moistureproof Transparent—High Softener (MT-35)	572		
Total Moistureproof Cellophane		16,279	22.0

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Table 2, Offer No. 1

1

PRINCIPAL COMPETITORS OF DU PONT IN MANUFACTURE OF COMPETING FLEXIBLE PACKAGING MATERIALS

SOURCE: MOODY'S INDUSTRIALS 1950

	Organized	Flexible Packaging Materials Manufactured	1949 Total Assets (M Dollars)	1949 Net Assets (M Dollars)	1949 Sales (M Dollars)
Riegel Paper Co.	1873	Glassine & greaseproof, waxing paper, other specialty papers	15285	12737	22992
Rhinelander	1903	Glassine & greaseproof	14720	10158	13410
Westfield River Paper Company	1916	Glassine	2132	1236	n.a.
Deerfield Glassine Co.	1927	Glassine	2089	1805	2781
Paterson Parchment Paper Co.	1889	Vegetable parchment & greaseproof.	6316	5878	5254
Kalamazoo Vegetable Parchment Co.	1909	Vegetable parchment & greaseproof.	29269	17193	34042
Marathon Corp.	1909	Sulphite and sulphate paper & paperboard	61888	43145	60048
Consolidated Water Power and Paper Company	1894	Sulphite wrapping tissue & coated papers	45066	32760	41241
Fraser Companies Ltd. (owns Fraser Paper Co.)	1917	Sulphite and groundwood specialty papers	37862	31569	n.a.
Visking	1925	Polyethelene film	14893	10669	19821
Hartford Empire Co. (owns Plax Corp.)	1922	Polyethelene film	18753	8421	12855
Dewey & Almy Chemical Company	1919	Cry-O-Rap	12308	4982	16297
Dow Chemical Co.	1897	Saran film	294337	189986	200371
Goodyear Tire & Rubber Company	1898	Pliofilm	424126	214294	663506
Celanese Corp. of America	1918	Acetate film	54886	154259	171292
Eastman Kodak Co.	1881	Acetate film	379697	318501	396233
Reynolds Metals Co.	1928	Aluminum foil	177479	55103	131865
Aluminum Co. of America	1888	Aluminum foil	525870	312536	347108
American Viscose Co. (Acquired Sylvania 1946)	1910	Cellophane	222396	191570	194664
Total of above Companies			2539366	1616802	2333780

DU PONT CELLOPHANE PRODUCTION BY TYPES

1925, 1929, 1939, 1949

1939 (Cont'd.)	Thousands of Pounds		Per Cent of Total
Moistureproof Heat-Sealing Cellophane:			
Moistureproof—Heat Sealing—Transparent & Colored (MST)	13,058		
Moistureproof—Heat Sealing—Rancidity Retardant—Colored (MSRC)	1		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags (MST-53)	23,880		
Moistureproof—Heat Sealing—One Side Coated—Transparent & Opaque (MSDT)	462		
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags—Heavy Coating (MST-57)	339		
Moistureproof—Heat Sealing—Transparent—Not Seasonally Adjusted—Heavy Coating (MST-56)	113		
Total Moistureproof Heat Sealing Cellophane		37,853	51.0
Other Moistureproof Cellophanes:			
Moistureproof—Heat Sealing—Anchored—Transparent & Colored—Normal & Extra Durability (MSAT)	442		
Less Moistureproof Transparent & Colored (LT)	424		
Less Moistureproof—Heat Sealing—Transparent (LST)	420		
Less Moistureproof—Anchored—Transparent & Colored (LAT)	222		
Total Other Moistureproof Cellophanes		1,508	2.0
Total All Cellophanes		74,148	100.0

1949			
Plain Cellophane:			
Plain Transparent & Colored (PT)	12,219		
Plain Opaque & Colored Opaque (PO)	14		
Plain Rancidity Retardant—Colored (PRC)	371		
Plain Transparent & Colored—High Humidity Use (PHT)	766		
Plain Transparent—Unsized (PUT)	3,193		
Plain Flame Resistant—T&C (PJT)	308		
Plain Transparent—Lower Durability than PT-62—Foliating Trade (PT-63)	36		
Total Plain Cellophane		16,907	9.0
Moistureproof Cellophane:			
Moistureproof Transparent & Colored (MT-31)	21,762		
Moistureproof Transparent—High Softener (MT-35)	1,001		
Moistureproof Transparent—Special for Cigars (MT-32)	2,012		
Moistureproof Transparent—Special for Candy (MT-36)	522		
Total Moistureproof Cellophane		25,297	14.0

IV. Facts as to Interchangeability and Competition

A. Industry Uses

Cellophane is sold for a variety of packaging end uses. There are set forth below 14 major industry uses for which cellophane is sold as a packaging material. These major end uses accounted for about 75% of du Pont sales in 1949. Other flexible packaging materials were sold for the same end uses. There was no major end use for cellophane which did not also utilize a number of other flexible packaging materials. These major industry uses are:

Industry Uses of du Pont Cellophane	Other Flexible Packaging* Materials Employed
Bread	Aluminum Foil Glassine Kraft Paper Pliofilm Sulphite Paper Tissue Waxed Paper
Crackers, Cookies & Biscuits	Aluminum Foil Glassine Kraft Paper Polyethylene Sulphite Paper Waxed Paper

* Materials used either alone or in combination with others. The order of listing is alphabetical and is not intended to indicate the relative position of the materials in sales for the use.

DU PONT CELLOPHANE PRODUCTION BY TYPES

1925, 1929, 1939, 1949

1949 (Cont'd.)	Thousands of Pounds	Per Cent of Total
Moistureproof Heat Sealing Cellophane:		
Moistureproof—Heat Sealing—Transparent & Colored (MST)	43,737	
Moistureproof—Heat Sealing—Rancidity Retardant—Colored (MSRC)	36	
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags (MST-53)	29,705	
Moisturepoof—Heat Sealing—T&C—Special Softener for Bread (MST-51)	28,266	
Moistureproof—Heat Sealing—One Side Coated—Transparent & Opaque (MSDT)	1,739	
Moistureproof—Heat Sealing—Flame Resistant—T&C (MSJC)	20	
Moistureproof—Heat Sealing—Transparent—Special Softener for Bags—Heavy Coating (MST-57)	335	
Moistureproof—Heat Sealing—Transparent—Not Seasonally Adjusted—Heavy Coating (MST-56)	970	
Moistureproof—Heat Sealing—Transparent—Low Softener—Minimum Shrinkage (MST-50)	210	
Moistureproof—Heat Sealing—Transparent—Special Formula for Cigars & Cigarettes (MST-58)	3,168	
Moistureproof—Heat Sealing—Transparent—Special Coating (K-202)	108	
Total Moistureproof Cellophane	108,295	61.0
Moistureproof—Anchored & Moistureproof—Heat Sealing Anchored Cellophane:		
Moistureproof—Anchored—Transparent (MAT)	708	
Moistureproof—Anchored—Transparent—Extra Durability (MAT-2)	4,323	
Moistureproof—Heat Sealing—Anchored—T&C—Normal & Extra Durability (MSAT)	8,141	
Moistureproof—Heat Sealing—Anchored—T&C—Heavy Coating (MSAT-84)	219	
Moistureproof—Heat Sealing—Anchored—Transparent—Special for Meat Wraps (MSAT-80)	4,307	
Total Moistureproof—Anchored & Moistureproof—Heat Sealing—Anchored Cellophane	17,698	10.0
Other Moistureproof Cellophanes:		
Less Moistureproof—Transparent & Colored (LST)	2,429	
Less Moistureproof—Anchored—Transparent & Colored (LAT)	1,087	
Less Moistureproof—Heat Sealing—Anchored—T&C (LSAT)	6,954	
Total Other Moistureproof Cellophanes	10,470	6.0
Total All Cellophanes	178,067	100.0

III. Facts About Competitive Flexible Packaging Materials

A. Interchangeability

Many other materials are used in substantial volume to package goods. Some, like cellophane, are flexible; others, like rigid plastics, glass jars, tin cans, and paper board, are not. There is considerable competition between the flexible and non-flexible packaging materials. Coffee and peanuts, for example, are packaged sometimes in flexible materials (bags) and sometimes in non-flexible materials (cans and jars). This offer of proof will be limited to the flexible packaging materials.

Cellophane and other flexible packaging materials compete directly among all classes of purchasers for all end uses and at all steps from the manufacturer to the ultimate consumer. These flexible packaging materials are functionally interchangeable. They are sold in substantial quantities to the same customers as cellophane, for the same uses, at the same time. They have comparable properties and are priced competitively.

B. Description

This offer of proof includes a study directed primarily to eleven flexible packaging materials that compete intensively with cellophane. Additional flexible packaging materials are included in parts of the study. For example, certain end use data include Kraft paper and tissues in converted packaging forms. The total U. S. production figures, however,

Industry Uses of du Pont Cellophane	Other Flexible Packaging Materials Employed
Candy	Aluminum Foil Cellulose Acetate Glassine Greaseproof Paper Kraft Paper Pliofilm Polyethylene Sulphite Paper Tissue Vegetable Parchment Waxed Paper
Chewing Gum	Aluminum Foil Cellulose Acetate Glassine Kraft Paper Polethylene Saran Sulphite Paper Tissue Waxed Paper
Meat & Poultry	Aluminum Foil Cellulose Acetate Cry-O-Rap Glassine Greaseproof Paper Kraft Paper Pliofilm Polyethylene Saran Sulphite Paper Tissue Vegetable Parchment Waxed Paper
Frozen Foods	Aluminum Foil Cellulose Acetate Cry-O-Rap Glassine Kraft Paper Pliofilm Polyethylene Saran Sulphite Paper Tissue Waxed Paper

do not include Kraft paper or tissues because of the large proportion of these materials that is used for purposes not directly competitive with cellophane. The eleven flexible packaging materials referred to above, each of which is used primarily for packaging, are:

1. Aluminum foil is a thin aluminum sheet. The gauges commonly used for packaging are from .0015 to .00035 inches. The foil is used by itself as a packaging medium. It is also laminated to glassine, paper or tissue, to other films, or to cellophane. It is opaque, brilliant of surface, highly moistureproof, and readily takes a semi-permanent set, known as "dead folding". It can be printed easily, and like cellophane can be sealed by heat when coated.

Industry Uses of du Pont Cellophane	Other Flexible Packaging Materials Employed
Potato Chips, Popcorn & Snacks	Aluminum Foil Glassine Kraft Paper Pliofilm Polyethylene Sulphite Paper Tissue Vegetable Parchment Waxed Paper
Fresh Produce	Aluminum Foil Cellulose Acetate Glassine Kraft Paper Pliofilm Polyethylene Saran Sulphite Paper Tissue Vegetable Parchment Waxed Paper
Nuts	Glassine Kraft Paper Pliofilm Polyethylene Sulphite Paper Waxed Paper
Dairy Products	Aluminum Foil Cellulose Acetate Glassine Kraft Paper Pliofilm Polyethylene Saran Sulphite Paper Tissue Vegetable Parchment Waxed Paper
Tobacco Products	Aluminum Foil Glassine Kraft Paper Pliofilm Polyethylene Sulphite Paper Waxed Paper

2. Cellulose acetate is a film usually made by the flowing of a solvent solution of cellulose acetate (a chemical compound of wood-pulp, cotton linters, and acetic acid) onto a large diameter, slow moving casting wheel, or metal belt. The solvent evaporates, and the dry film is stripped from the wheel or belt as it turns. The film can also be made by an extrusion process. It is transparent and dimensionally stable (will not shrink or pucker with humidity changes). It is waterproof, but has high permeability to moisture. It can be printed easily, and sealed by heat, if coated. It has a high surface gloss.

3. Cry-O-Rap is the trade name of a film made from a modified polyvinylidene chloride resin. Its chief characteristics are chemical inertness, transparency, durability, and flexibility at low temperatures. It can be shrunk around irregularly shaped objects by application of moderate heat.

4. Greaseproof paper is made by beating wood-pulp in a vat filled with water until the fibers

Industry Uses of du Pont Cellophane	Other Flexible Packaging Materials Employed
Textiles & Hosiery	Cellulose Acetate Glassine Kraft Paper Pliofilm Polyethylene Tissue Sulphite Paper
Paper Products	Cellulose Acetate Glassine Kraft Paper Pliofilm Polyehtylene Sulphite Paper Tissue Vegetable Parchment
Drugs, Cosmetics, and Medical Supplies	Aluminum Foil Cellulose Acetate Glassine Kraft Paper Pliofilm Polyethylene Saran Sulphite Paper Tissue Taxed Paper

B. Comparable Physical Properties

No single physical property or commercial characteristic is decisive in the selection of any particular flexible packaging material for an individual packaging use. Each particular class of users has special packaging problems depending upon the nature of the product to be wrapped and the trade in which it is sold. The user seeks the optimum combination of cost and the physical properties which will suit his particular requirements.

Certain physical properties of flexible packaging materials are recognized by the trade as the yardsticks to be used in determining the suitability of the various materials for particular packaging purposes. These properties are:

1. Heat - sealability
2. Printability
3. Clarity
4. Tear strength
5. Bursting strength
6. Water absorption
7. Moisture vapor permeability
8. Permeability to gases
9. Dimensional stability
10. Greaseproofness
11. Machine running qualities

Recognized standards of rating each of these properties in different flexible packaging materials have been evolved. These standards are employed in the constant testing of packaging materials by independent laboratories, by users, and by the manufacturers of the materials themselves. The following table (Table 3, Offer No. 1) rates cellophane and each of the eleven described competitive flexible packaging materials for each of these important physical properties.

C. Competitive Prices

Du Pont commenced manufacture of cellophane in 1924. A number of flexible packaging materials were then already well established and were being sold in substantial quantities for packaging purposes. The principal flexible packaging materials with which cellophane immediately came into competition were glassine, waxed paper, greaseproof paper, vegetable parchment, and aluminum foil. The following chart (Chart 2, Offer No. 1), designated "Wholesale Price Histories of Selected Flexible Packaging Materials", compares prices of du Pont cellophane with the prices contemporaneously charged by leading manufacturers of other flexible packaging materials from 1924 onward. Prices are stated in cents per 1,000 square inches. Area coverage is an accepted measurement in the trade of relative price inasmuch as the function of all such materials is the packaging of goods, and area coverage is a major factor in ascertaining cost per unit.

This chart discloses that both plain and moisture-proof cellophane have at all times cost more per 1,000 square inches than glassine, waxed paper, greaseproof paper and vegetable parchment. Moistureproof cellophane has at all times cost more per 1000 square inches than aluminum foil, and until 1941 cost more than cellulose acetate. The

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Table 3, Offer No. 1

PHYSICAL PROPERTIES

Packaging Material	Heat Sealability	Printability	Clarity	Tear Strength (Elmendorf)	Bursting Strength	Water Absorption in 24 Hrs. Immersion	Moisture Permeability	Permeability to Gases(2)	Dimens. Change With Humid. Diff.	Resistance to Greases & Oils	Wrapping Machine Running Qualities
Cello. (plain)	Yes (if coated)	Yes	Highly Transparent	Low	High	High	High	Very Low	Large	Excellent	O. K.
Cello. (Moistureproof)	Yes (if coated)	Yes	Highly Transparent	Low	High	High	Low-Medium	Very Low	Large	Excellent	O. K.
Plain greaseproof paper	No	Yes	Opaque	Good	Low	High	High	Medium	Moderate	Good	O. K.
Plain Glassine	No	Yes	Commercially Transparent to Opaque	Good	Low	High	High	Low	Moderate	Good	O. K.
Lacquered Glassine	Yes	Yes	Commercially Transparent to Translucent	Good	Low	Low	Low-Medium	Low	Moderate	Good	O. K.
Waxed Glassine	Yes	(1)	Commercially Transparent to Translucent	Good	Low	Low	Low	Low	Moderate	Good	O. K.
Vegetable Parchment	No	Yes	Tends to be Opaque	Good	Good	High	High	Low	Moderate	Good	O. K.
Waxed Paper (18 lbs. or over)	Yes	(1)	Commercially Transparent to Opaque	High	Good	Low	Low-Medium	High	Moderate	None	O. K.
Aluminum Foil	No	Yes	Opaque	Low	Low	Nil	Very Low	Very Low	None	Excellent	O. K.
Aluminum Foil (Heat Sealing)	Yes	Yes	Opaque	Low	Low	Nil	Nearly Nil	Very Low	None	Excellent	O. K.
Cellulose Acetate	Yes	Yes	Highly Transparent	Low	High	Low	High	Variable	Very Small	Excellent	O. K.
Pliofilm (rubber hydrochloride)	Yes(3)	Yes(3)	Highly Transparent with Slight Haze	Medium	High	Low	Medium	Low	Very Small	Excellent	Good(3)
Saran (Vinylidene chloride)	Yes(3)	Yes(3)	Highly Transparent	High	High	Low	Very Low	Very Low	None	Excellent	Poor(3)
Polyethylene	Yes(3)	Yes(3)	Transparent with Slight Haze	High	High	Low	Medium	High	None	(4)	Poor(3)
CryORap	Yes(3)	Yes(3)	Transparent with Slight Haze	High	High	Low	Medium	Low	None	Excellent	Poor(3)
Sulphite (high finish wrapper and label paper)	No	Yes	Opaque	High	Medium	High	Very High	High	Moderate	None	O. K.

References: (1) Normally printed before waxing.

(2) The permeability to gases can vary greatly depending upon the gas and the humidity conditions. The levels indicated in this chart apply particularly to flavor type volatiles as found in many food products.

(3) Plastic films may require special heat sealing techniques, and printing processes or special machines.

(4) Not affected by oils but penetrated by some oils.

(5) The information on this chart is based upon the generally accepted properties of the materials listed; however, materials produced by different processes, formulations, coatings, raw materials, surface treatments, and thicknesses can show considerable variation from the properties indicated.

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

END USE—DRIED FRUITS (DATES, FIGS, RAISINS, ETC.).

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT						X									X					2
Cellophane MT						X						X			X					3
Duplex—Cellophane MT and Cellopliane MT												X								1
Cellophane MT and Glassine, Window Type						X														1
Foil Laminated to Bond																	X			1
Foil Laminated to Tissue to Tissue																	X			1
Foil Laminated to Tissue, Plus Coating						X														1
Glassine				X																1
Laminated Opaque Glassine												X								1
Duplex—Glassine and Kraft				X																1
Duplex—Glassine and Bleached Kraft				X																1
Duplex—Laminated Glassine and Kraft				X																1
Laminated Glassine Laminated to Kraft				X																1
Kraft				X																1
Bleached Kraft				X																1
Sulphite																			X	1
Waxed Opaque Sulphite					X															1
Waxed Clear Transparent Sulphite					X															1
Cellulose Acetate						X						X	X							3
Pliofilm						X						X	X		X					4

FLEXIBLE PACKAGING MATERIALS

IMPORTANCE OF MAJOR MATERIAL GROUPS BY PRINCIPAL END USES

(BASED ON ANALYSIS OF 1949 SALES OF 19 CONVERTERS)

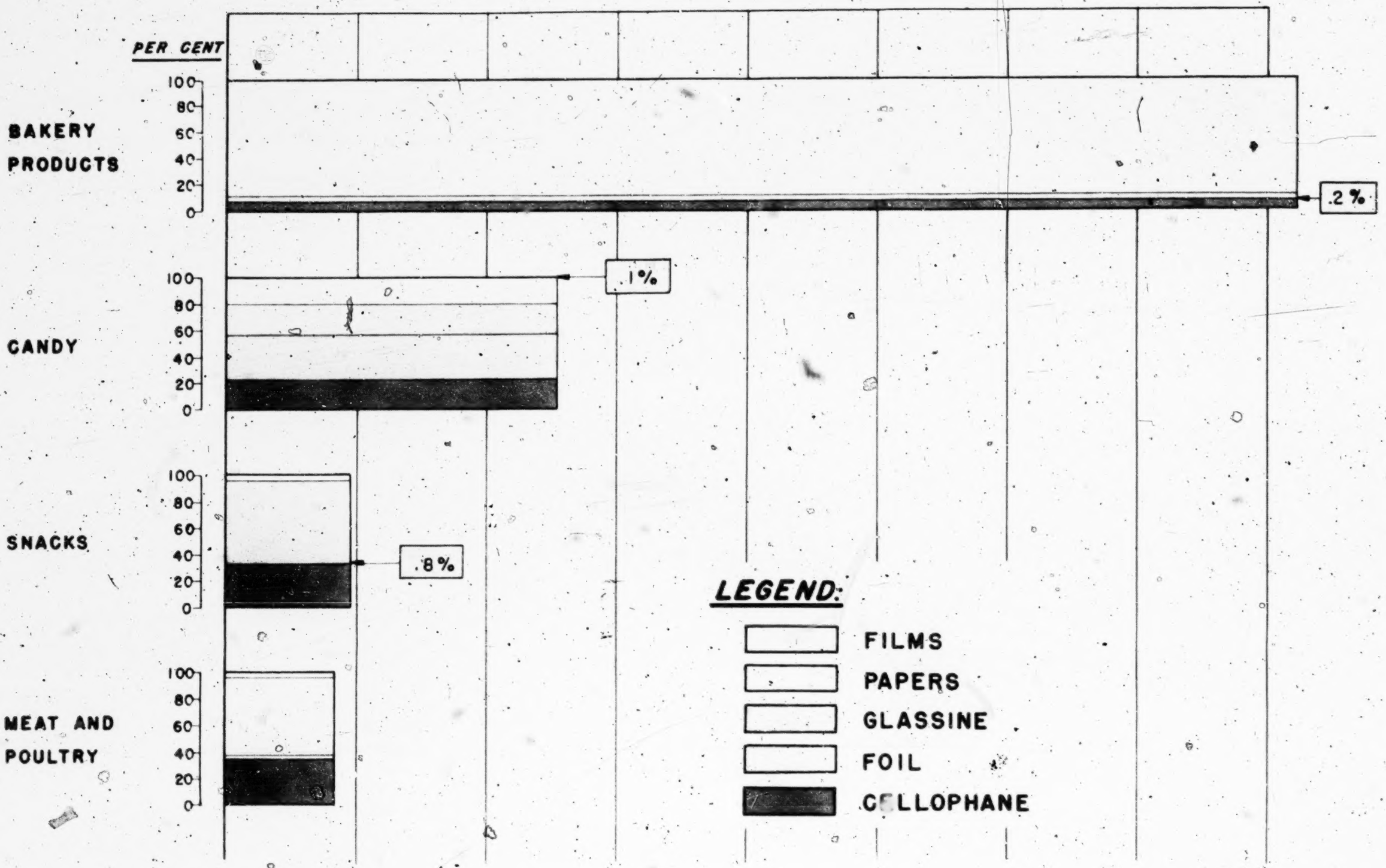

Table 4, Offer No. 1

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Cheese

Material	Converter																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT	X												X				X			3
Cellophane MT	X	X	X				X			X		X	X				X			8
Laminated Cellophane MT																	X			1
Cellophane MT, Coated												X					X			2
Laminated Cellophane MT, Coated												X					X			2
Cellophane MT Laminated to Glassine																	X			1
Foil	X																X			2
Foil Laminated to Bond						X														1
Foil Laminated to Parchment						X														1
Foil Laminated to Sulphite																	X			1
Foil Laminated to Tissue						X						X								2
Foil Laminated to Waxed Tissue																	X			1
Foil, Coated						X											X			2
Coated Foil Laminated to Parchment						X														1
Coated Foil Laminated to Tissue						X														1
Glassine	X	X															X	X		4
Duplex—Glassine and Kraft														X						1
Parchment							X								X			X		3
Sulphite																	X			1
Waxed Kraft															X					1
Waxed Parchment															X					1
Waxed Bleached Sulphite	X														X					1
Cellulose Acetate	X																			1
Pliofilm	X												X				X	X		4
Polyethylene													X				X			2
Laminated Pliofilm																	X			1

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MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Fresh Vegetables

Material	Converter 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Cellophane PT	X								X							X	X			4
Cellophane MT	X		X	X	X	X	X		X	X		X	X			X	X			12
Duplex—Cellophane MT and Cellophane MT									X			X								2
Duplex—Cellophane PT and Cellophane MT					X															1
Cellophane PT and Kraft, Window Type	X																			1
Cellophane PT and Tissue, Window Type									X											1
Cellophane MT and Glassine, Window Type									X											1
Cellophane MT and Kraft	X																			1
Triplex—Cellophane PT and Kraft and Kraft	X																			1
Cellophane MT Laminated to Cellulose Acetate									X											1
Foil																			X	1
Foil Laminated to Waxed Glassine											X					X				2
Glassine	X								X											2
Duplex—Glassine and Kraft												X								1
Kraft	X																			1
Sulphite										X	X									2
Duplex—Kraft and Kraft	X																			1
Duplex—Kraft and Waxed Kraft	X																			1
Waxed Kraft											X									1
Waxed Manila											X									1
Waxed Bleached Sulphite										X	X							X		3
Waxed Opaque Sulphite											X									1
Kraft and Mesh, Window Type	X																			1
Cellulose Acetate					X	X			X	X							X			5
Laminated Cellulose Acetate									X											1
Pliofilm					X		X													2

Source: Analysis 1949 Sales Flexible Packaging Materials—19 Converters.

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MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Potato Chips

Material	Converter																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane MT	X			X	X				X	X	X	X		X	X	X	X	X		12
Duplex—Cellophane MT and Cellophane MT		X		X					X	X		X		X	X					7
Duplex—Cellophane MT and Glassine		X													X					2
Foil															X					1
Foil Laminated to Glassine		X							X				X							3
Foil Laminated to Sulphite									X											1
Foil Laminated to Tissue, Plus Coating									X											1
Glassine	X	X	X						X			X			X	X				7
Duplex—Glassine		X							X											2
Laminated Glassine	X	X										X								3
Waxed Glassine		X	X		X						X					X			X	6
Waxed Laminated Glassine									X							X				2
Duplex—Waxed Glassine		X	X																	2
Duplex—Waxed Glassine and Glassine		X																		1
Glassine Laminated to Waxed Glassine		X																		1
Duplex—Glassine and Kraft		X																		1
Kraft		X							X			X								3
Waxed Kraft																X				1
Waxed Bleached Sulphite			X			X					X									3
Pliofilm									X											1
Polyethylene														X						1

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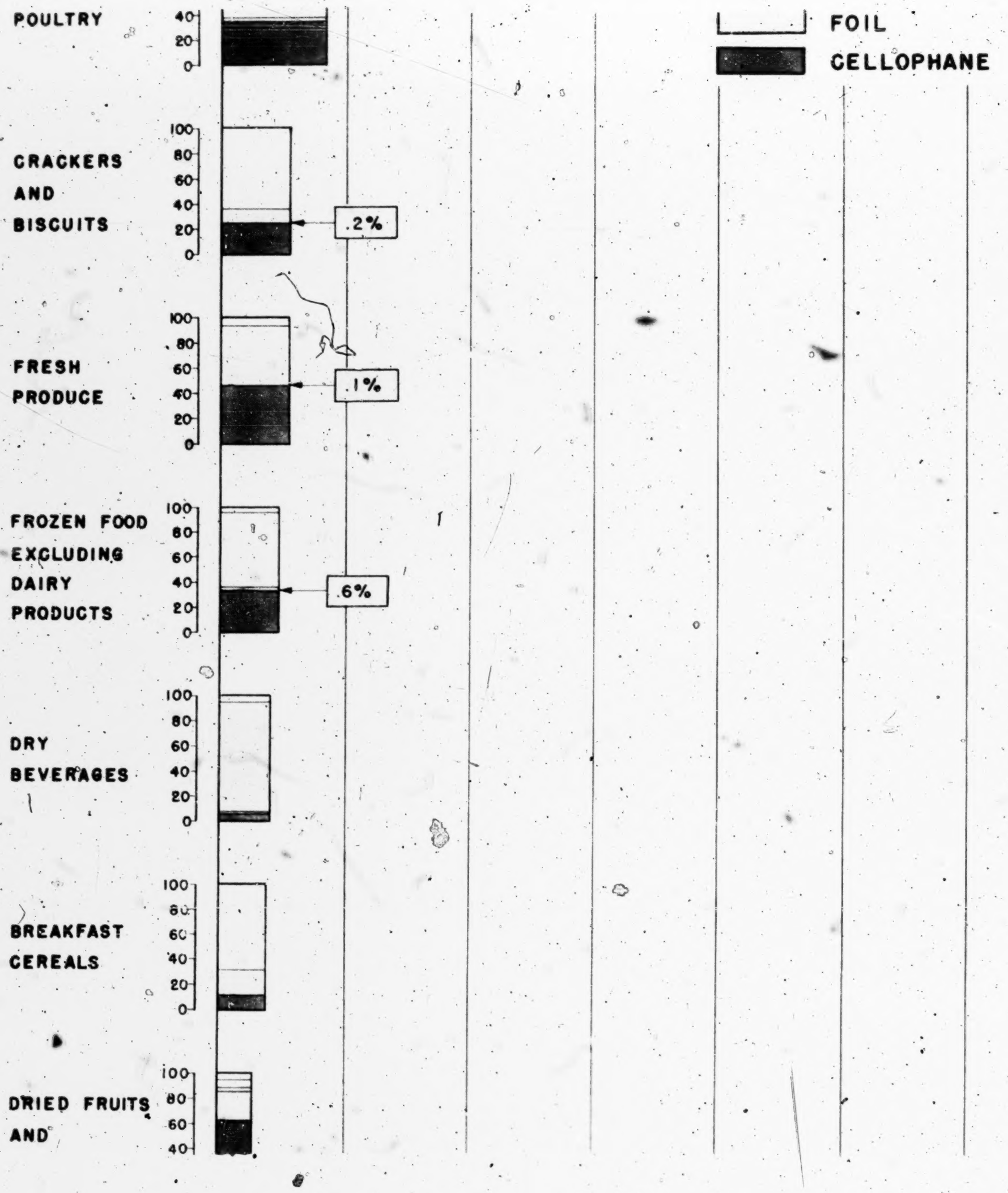
The charts and tabulations which follow show the results of the converter survey:

Chart 3, Offer No. 1

Chart 4, Offer No. 1

Table 5, Offer No. 1 (explains material groups, Chart 3)

Table 6, Offer No. 1 (supports charts 3 and 4)


FOIL
CELLOPHANE
POULTRY
40
20
0
CRACKERS
AND
BISCUITS
100
80
60
40
20
0
.2%
FRESH
PRODUCE
.1%
FROZEN FOOD
EXCLUDING
DAIRY
PRODUCTS
.6%
DRY
BEVERAGES
BREAKFAST
CEREALS
DRIED FRUITS
AND

FLEXIBLE PACKAGING MATERIALS

RELATIVE IMPORTANCE OF PRINCIPAL END USES ALL MATERIALS AND CELLOPHANE

(BASED ON ANALYSIS OF 1949 SALES OF 19 CONVERTERS)

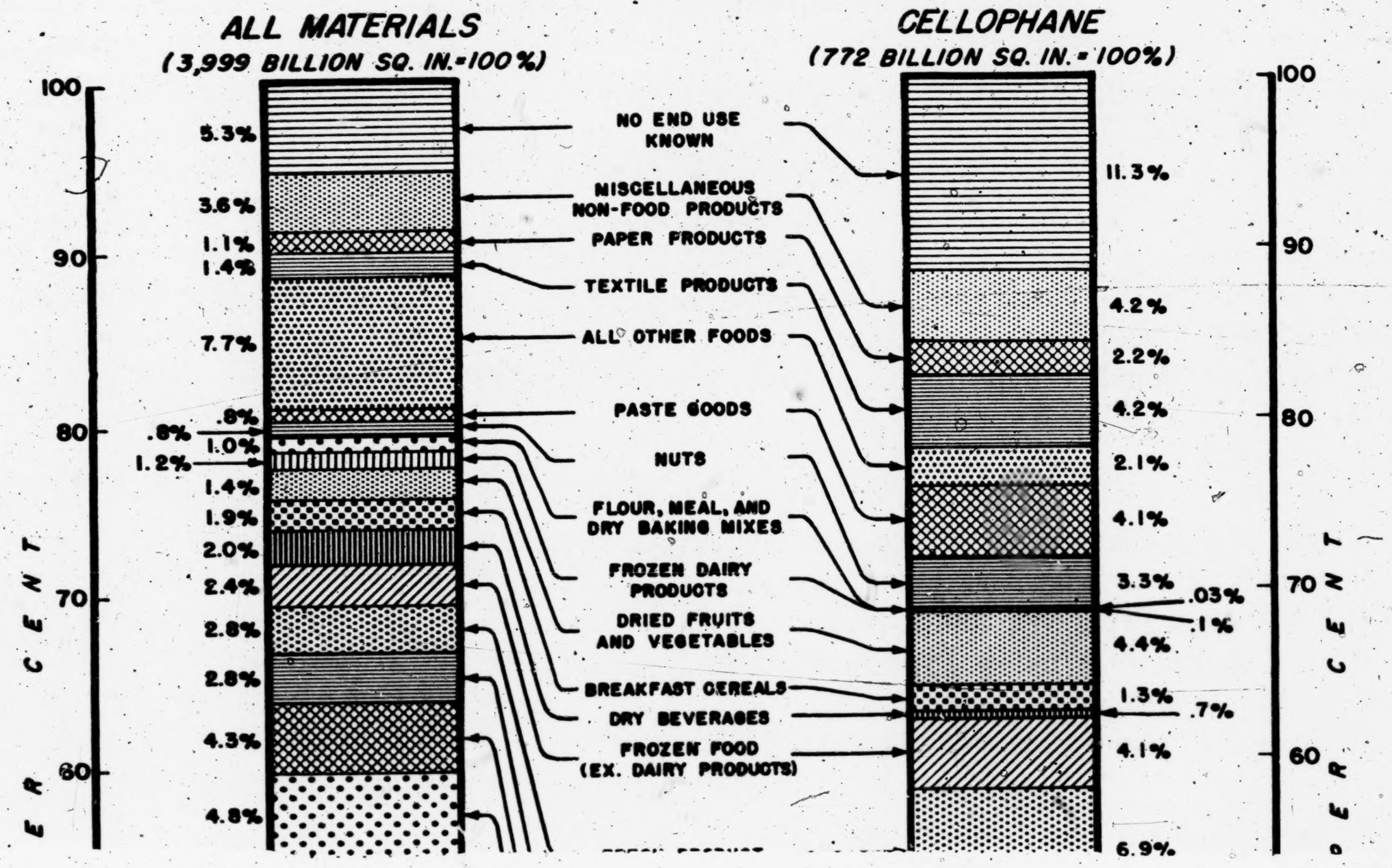


Table 5, Offer No. 1
(explains material groups - chart 3)

1

IMPORTANCE OF PRINCIPAL MATERIALS IN CONVERTER STUDY

(Billions of Square Inches)

Cellophane and Combinations

Cello MT	547	
Cello PT	88	
Duplex Cello MT	51	
Cello MT & Glassine Window Type	26	
Duplex Cello PT	19	
Cello MT & Kraft Window Type	12	
Cello PT & Kraft Window Type	5	
Coated Cello, MT	4	
Lam. Cello MT	3	
Duplex Cello MT & Glassine	3	
Lam. Cello to Kraft	3	
Cello MT & Vellum Paper Window	3	
Cello PT & Greaseproof Window Type	2	
Lam. Cello MT to Opaque Glassine	1	
Miscellaneous Cellophane Combinations	4	
Total Cellophane and Combinations		771

Foil and Combinations (Except with Cellophane)

Foil	128	
Lam. Foil to Tissue	23	
Lam. Foil to Waxed Tissue	14	
Lam. Foil to Glassine	11	
Lam. Foil to Bond	9	
Lam. Foil to Glassine to Coated Foil	7	
Lam. Foil to Acetate	5	
Lam. Coated Foil to Parchment	4	
Lam. Coated Foil to Tissue	4	
Lam. Foil to Kraft	3	
Lam. Foil to Sulphite	3	
Lam. Foil to Tissue to tissue	3	
Lam. Foil to Parchment	1	
Lam. Foil to Acetate to Pliofilm	1	
Miscellaneous Foil Combinations	6	
Total Foil and Combinations (Except with Cellophane)		222

Table 5, Offer No. 1
(explains material groups - chart 3)

Glassine and Combinations (Except with Cellophane or Foil)

Glassine	223
Waxed Glassine	136
Lam. Glassine	38
Duplex Glassine & Kraft	38
Lam. Glassine to Kraft	21
Duplex Glassine & Bleached Kraft	21
Duplex Waxed Glassine	13
Coated Glassine	12
Duplex Lam. Glassine & Bleached Kraft	8
Duplex Glassine	6
Duplex Lam. Glassine & Kraft	4
Opaque Glassine	3
Duplex Glassine & Sulphite	2
Lam. Glassine to Opaque Sulphite	2
Waxed Lam. Glassine	2
Duplex Waxed Glassine & Sulphite	2
Lam. Waxed Glassine & Sulphite	2
Triplex Glassine & Kraft & Kraft	1
Miscellaneous Glassine Combinations	2
Total Glassine and Combinations (Except with Cellophane or Foil)	536

Films and Combinations (Except with Cellophane, Foil, Glassine, or Other Papers)

Pliofilm	29
Polyethylene	10
Cellulose Acetate	8
Coated Pliofilm	4
Visten 10	3
Vinyl	1
Lam. Pliofilm	1
Miscellaneous Synthetic Films	1
Total Synthetic Films and Combinations (Except with Cellophane, Foil, Glassine, or Other Papers)	57

Table 5, Offer No. 1
(explains material groups - chart 3)

Papers and Combinations (Except with Cellophane, Foil, or Glassine)

Waxed Bleached Sulphite	1,128
Waxed Opaque Sulphite	628
Waxed Kraft	130
Parchment	119
Sulphite	90
Kraft	56
Waxed Clear Transparent	30
Moldproofed Sulphite	26
Bleached Kraft	25
Kraft & Mesh (Window Type)	25
Waxed Parchment	22
Waxed Twisting	18
Waxed Manila	11
Dry Waxed	11
Greaseproof	10
Duplex Kraft	10
Lam. Sulphite	10
Lam. Waxed Sulphite	10
Waxed Tissue	10
Duplex Kraft & Waxed Kraft	6
Waxed Opaque Twisting	4
Manila	3
Casein Coated Sulphite	3
Tissue	2
Duplex Wet Strength Kraft	2
Duplex Kraft & Asphalt Lam. Kraft	2
Duplex Kraft & Bleached Kraft	2
Lam. Waxed Manila	2
Coated Sulphite	2
Triplex Kraft & Kraft & Kraft	1
Asphalt Lam. Sulphite	1
Waxed Bleached Kraft	1
Miscellaneous Papers	13
Total Other Papers and Combinations (Except with Cellophane, Foil, or Glassine)	2,413
Total all Materials	3,999

Table 6, Offer No. 1
(Supports Charts 3 and 4)

1

PRINCIPAL PACKAGING MATERIALS BY MAJOR END USES

(Millions of Square Inches)

	Quantity	Per Cent of Total End Use
Bakery Products		
Cellophane	109,655	6.7
Foil	2,652	.2
Glassine	72,244	4.4
Papers	1,456,202	88.7
Films	214	.0
	1,640,967	100.0
Candy		
Cellophane	134,732	24.7
Foil	178,968	32.8
Glassine	117,629	21.5
Papers	114,468	20.9
Films	483	.1
	546,280	100.0
Snacks		
Cellophane	61,258	32.1
Foil	1,572	.8
Glassine	120,414	63.0
Papers	7,836	4.1
Films	78	.0
	191,158	100.0
Meat and Poultry		
Cellophane	59,239	35.0
Foil	88	.0
Glassine	4,525	2.7
Papers	97,254	57.5
Films	8,174	4.8
	169,280	100.0
Crackers and Biscuits		
Cellophane	29,959	26.6
Foil	183	.2
Glassine	11,254	10.0
Papers	71,147	63.2
Films	8	.0
	112,551	100.0
Fresh Produce		
Cellophane	52,866	47.3
Foil	43	.0
Glassine	96	.1
Papers	51,035	45.6
Films	7,867	7.0
	111,907	100.0

Table 6, Offer No. 1
(Supports Charts 3 and 4)

PRINCIPAL PACKAGING MATERIALS BY MAJOR END USES

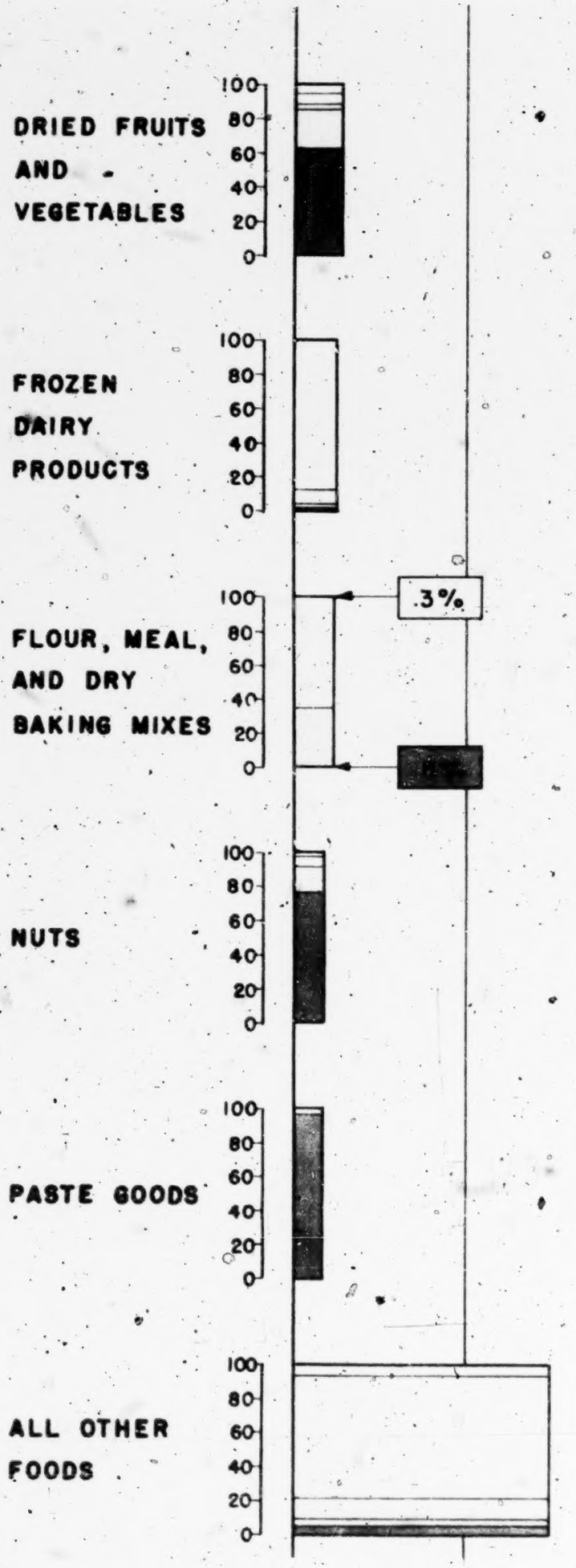
(Millions of Square Inches)

	Quantity	Per Cent of Total End Use
Frozen Food Excluding Dairy Products		
Cellophane	31,684	32.8
Foil	629	.6
Glassine	2,304	2.4
Papers	58,746	60.9
Films	3,154	3.3
	96,517	100.0
Dry Beverages		
Cellophane	5,416	6.7
Foil	758	1.0
Glassine	69,409	86.4
Papers	4,756	5.9
Films	35	.0
	80,374	100.0
Breakfast Cereals		
Cellophane	9,884	12.8
Foil	—	—
Glassine	14,394	18.7
Papers	52,804	68.5
Films	—	—
	77,082	100.0
Dried Fruits and Vegetables		
Cellophane	34,255	63.8
Foil	11,969	22.3
Glassine	1,880	3.5
Papers	3,304	6.2
Films	2,246	4.2
	53,654	100.0
Frozen Dairy Products		
Cellophane	564	1.2
Foil	1,547	3.1
Glassine	4,350	8.8
Papers	42,803	86.9
Films	—	—
	49,264	100.0
Flour, Meal, and Dry Baking Mixes		
Cellophane	193	.5
Foil	—	—
Glassine	14,825	35.9
Papers	26,096	63.3
Films	126	.3
	41,240	100.0

PRINCIPAL PACKAGING MATERIALS BY MAJOR END USES

(Millions of Square Inches)

	Quantity	Per Cent of Total End Use
Nuts		
Cellophane	25,084	77.3
Foil	—	—
Glassine	4,622	14.2
Papers	1,976	6.1
Films	787	2.4
	32,469	100.0
Paste Goods		
Cellophane	31,639	97.5
Foil	—	—
Glassine	—	—
Papers	808	2.5
Films	13	0.0
	32,460	100.0
All Other Foods		
Cellophane	16,524	5.4
Foil	11,846	3.9
Glassine	35,960	11.7
Papers	220,019	71.8
Films	22,098	7.2
	306,447	100.0
Textile Products		
Cellophane	32,103	57.7
Foil	26	.0
Glassine	7,261	13.1
Papers	14,364	25.8
Films	1,917	3.4
	55,671	100.0
Paper Products		
Cellophane	16,878	38.1
Foil	7	.0
Glassine	1,873	4.2
Papers	25,316	57.1
Films	281	.6
	44,355	100.0
Miscellaneous Non-Food Products		
Cellophane	32,229	22.1
Foil	7,898	5.4
Glassine	8,211	5.6
Papers	95,489	65.5
Films	2,063	1.4
	145,890	100.0


DRIED FRUITS AND VEGETABLES
100
80
60
40
20
0
FROZEN DAIRY PRODUCTS
100
80
60
40
20
0
FLOUR, MEAL, AND DRY BAKING MIXES
100
80
60
40
20
0
.3%
NUTS
100
80
60
40
20
0
PASTE GOODS
100
80
60
40
20
0
ALL OTHER FOODS
100
80
60
40
20
0

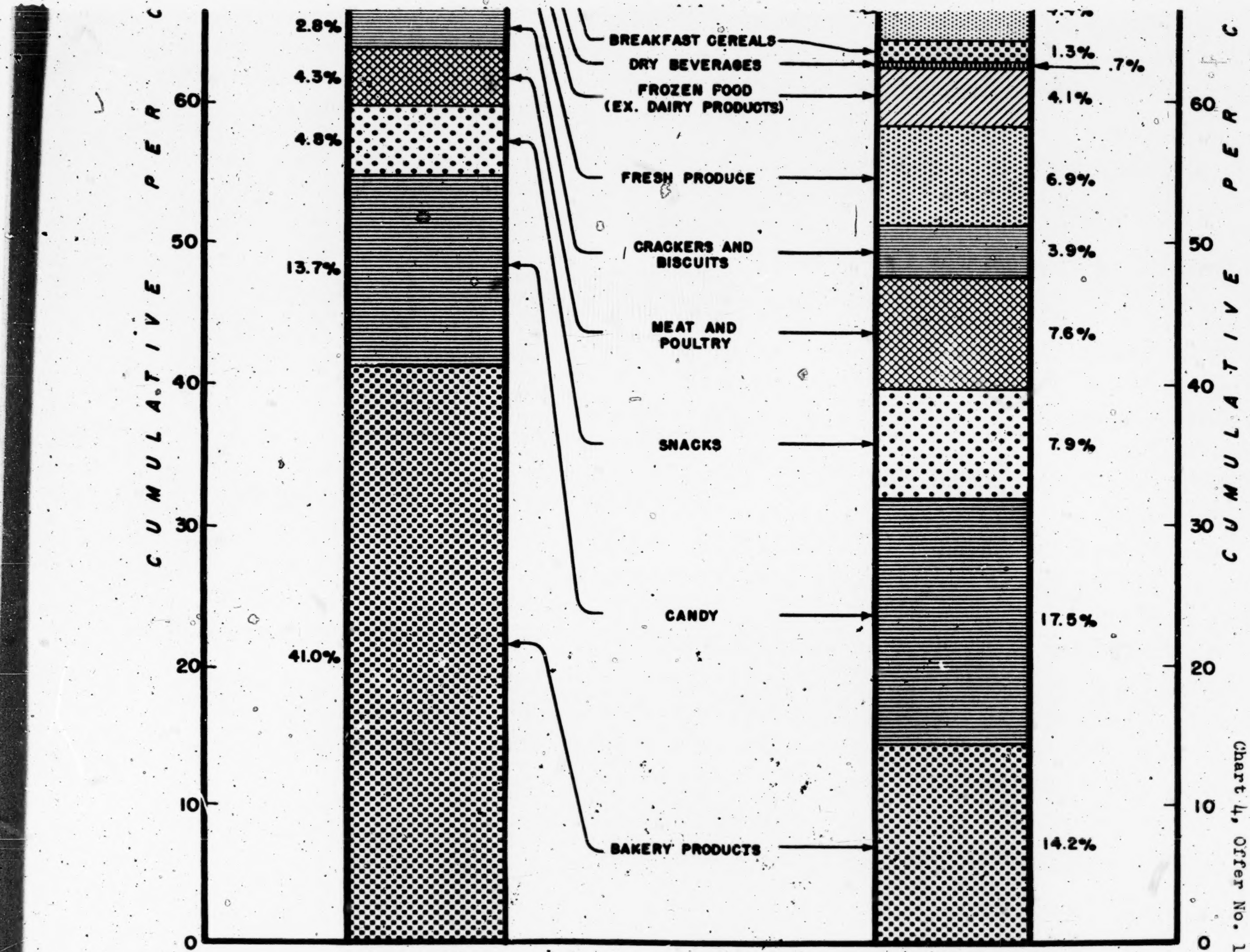


Chart 4, Offer No. 1

Table 6, Offer No. 1
(Supports Charts 3 and 4)

PRINCIPAL PACKAGING MATERIALS BY MAJOR END USES

(Millions of Square Inches)

	Quantity	Per Cent of Total End Use
No End Use Known		
Cellophane	87,578	41.4
Foil	3,725	1.8
Glassine	44,956	21.2
Papers	68,314	32.2
Films	7,109	3.4
	211,682	100.0
Grand Total	3,999,248	

NOTES TO SCHEDULE, "PRINCIPAL PACKAGING MATERIALS BY MAJOR END USES"

1. "All Other Food Products" includes Sandwiches, Dessert Mixes, Shortening, Sugar, Yeast, Fish, and Dairy Products (Not Frozen).
2. "Miscellaneous Non-Food Products" includes Kitchen and Bath Supplies, Rubber and Plastic Products, Drugs and Cosmetics, Products N.E.C., and Tobacco Products (a very small part of the tobacco market).
3. "No End Use Known" is principally stock bags.

V. Facts as to du Pont's Position in the Part of Trade and Commerce Comprising Flexible Packaging Materials.

A statistical study has been made of the total domestic production and imports of cellophane and the eleven described flexible packaging materials for the years 1925 to 1949, biennially. Since the great bulk of these materials is sold, like cellophane, for packaging purposes, a comparison of du Pont's cellophane production with the total production and imports of cellophane and the other materials provides a reliable measure of du Pont's cellophane position in the market. This position would have been appreciably reduced if production of Kraft paper and tissues, which are in fact sold in substantial amounts for packaging purposes, had been included in the totals. The statistical study discloses that in 1947 the position of du Pont cellophane in the production and imports of all cellophane and the eleven materials was 10.1% on a tonnage basis and 12.3% on an area basis. Detailed figures for the entire period appear in Tables 7 and 8, Offer No. 1, which follow.

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POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED[a] FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packing Materials

(Figures in Tons of 2,000 Pounds)

Total United States Production and Imports of Selected Flexible Packaging Materials	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
Glassine, Greaseproof, and Vegetable Parchment Papers	63 037	80 938	72 677	63 059	70 555	64 866	80 828	96 967	125 040	144 328	139 972	156 380	125 451
Waxing Papers (18 Pounds and over)	36 079	64 920	48 276	44 569	59 496	73 924	124 130	141 143	173 746	193 610	218 437	246 218	180 276
Sulphite Bag and Wrapping Papers	89 241	162 510	119 306	108 657	144 485	178 937	295 480	348 346	320 424	179 711	137 458	129 577	97 816
Aluminum Foil	1 040	2 047	2 571	3 035	3 983	4 904	8 149	9 135	4 117	4 000	20 100	35 063	42 697
Cellophane	530	974	3 351	14 204	21 199	28 933	40 930	50 040	70 368	63 865	63 507	87 279	114 424
Cellulose Acetate				5	167	509	1 077	1 498	2 695	3 094	4 010	4 101	4 194
Pliofilm, Polyethylene, Saran and Cry-O-Rap[b]	Not available until 1947											2 868	13 152
Total	189 927	311 389	246 181	233 529	299 885	352 073	550 594	647 129	696 390	588 608	583 484	661 486	578 010
Total Du Pont Cellophane Production	472	945	3 028	12 310	16 981	21 904	30 511	37 074	53 175	48 826	48 201	66 751	89 333
Du Pont Cellophane Per Cent of Total United States Production and Imports of Selected Flexible Packaging Materials	0.2%	0.3%	1.2%	5.3%	5.7%	6.2%	5.5%	5.7%	7.6%	8.3%	8.3%	10.1%	15.5%

Notes: (a) As defined in this offer.
(b) Combined to avoid disclosure of figures for individual firms.

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POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in Tons of 2,000 Pounds)

Total United States Production of Selected Flexible Packaging Materials	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
Glassine, Greaseproof, and Vegetable Parchment Papers	61 841	80 110	71 915	62 876	70 239	64 577	80 100	96 630	125 032	144 324	139 969	156 310	125 430
Waxing Papers (18 Pounds and over)	35 780	64 483	47 859	44 311	59 329	73 712	123 896	141 007	173 687	193 553	218 427	246 131	180 215
Sulphite Bag and Wrapping Papers	86 610	156 090	115 851	107 262	143 614	178 431	294 796	346 468	318 212	179 500	136 771	119 040	95 960
Aluminum Foil	1 000	1 500	2 000	2 500	3 678	4 432	6 787	7 721	4 000	4 000	20 000	35 022	42 500
Cellophane	472	945	3 028	1[illegible] 185	21 164	28 798	40 856	50 004	70 310	63 865	63 507	87 275	114 419
Cellulose Acetate				5	167	509	1 077	1 498	2 695	3 094	4 010	4 101	4 194
Pliofilm, Polyethylene, Saran and Cry-O-Rap		Not available until 1947										2 868	13 152
Total	185 703	303 128	240 653	231 139	298 191	350 459	547 512	643 328	693 976	588 336	582 684	650 747	575 870

NOTES: (a) Only those competitive flexible packaging materials have been included which are directly competitive with cellophane. Certain grades of kraft paper, paper board, waxing tissue, butchers and grocers papers, etc., are competitive with cellophane in many end uses but have been omitted from this study.
(b) Cellulose acetate was first produced commercially in the United States in 1931.
(c) Combined to avoid disclosures of figures for individual firms. Pliofilm first produced commercially in 1935.
(d) These films were discontinued for civilian packaging uses during World War II.

SOURCES: Figures based on official U. S. Department of Commerce Bureau of the Census, publications and official U. S. Department of Commerce tabulations certified by the Director, Bureau of the Census. In some years where U. S. Census figures were incomplete, estimates were made based on available official statistics and records of individual companies kept in the normal course of business.

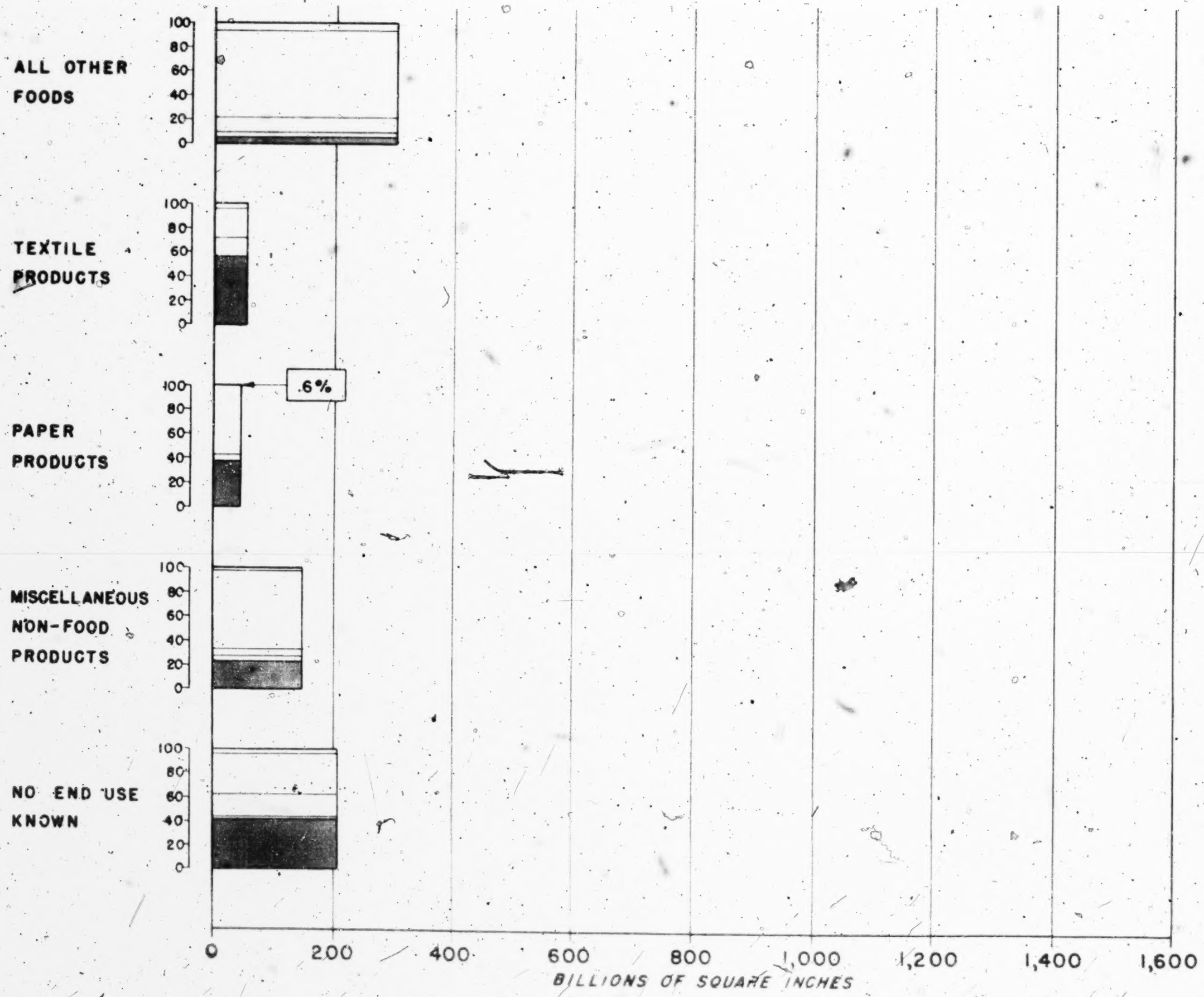

Chart 3, Offer No. 1

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in Tons of 2,000 Pounds)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
Total United States Imports of Selected Flexible Packaging Materials													
Glassine, Greaseproof, and Vegetable Parchment Papers[a]	1 196	828	762	183	316	289	728	337	8	4	3	70	21
Waxing Papers (18 Pounds and over)[b]	299	437	417	258	167	212	234	136	59	57	10	87	61
Sulphite Bag and Wrapping Papers[c]	2 631	6 420	3 455	1 395	871	506	684	1 878	2 212	211	687	10 537	1 856
Aluminum Foil	40	547	571	535	305	472	1 362	1 414	117	*	100	41	197
Cellophane[d]	58	29	323	19	35	135	74	36	18	*	*	4	5
Cellulose Acetate[e]													
Pliofilm, Polyethylene, Saran and Cry-O-Rap[f]													
Total	4 224	8 261	5 528	2 390	1 694	1 614	3 082	3 801	2 414	272	800	10 739	2 140

NOTES: (a) Includes "Grease-proof and imitation parchment paper, super calendered and transpafent (include glassine paper)", "Vegetable parchment paper by whatever name known", and "Grease-proof and imitation parchment paper, n.s.p.f.)".

(b) Listed as "Paraffined or wax-coated paper" and includes "Bags and articles of surface-coated, parchment or similar papers".

(c) Includes M.G. and M.F. Sulphite wrapping and "Other wrapping, n.e.s." "Other wrapping, n.e.s." has been reduced 10% to eliminate non-competitive wrapping papers.

(d) Listed as "Cellulose products, n.e.s.: Sheets, bands, and strips of transparent cellulose film exceeding 1 inch in width but not exceeding 3/1000 inch in thickness made from cellulose, except cellulose acetate". Excludes converted film such as bags, etc., for which only dollar figures are available.

(e) Cellulose acetate omitted from this schedule because film is not reported separately.

(f) No imports reported.

* Less than 1 ton.

SOURCES: Figures based on an official U. S. Department of Commerce Schedule, certified by the Director, Bureau of the Census, entitled "Imports for Consumption of Certain Flexible Materials Suitable for Wrapping 1923-1949".

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POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED(a) FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION AND IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers	1 566 059	2 013 782	1 808 420	1 570 560	1 756 801	1 615 221	2 011 334	2 414 879	3 115 643	3 595 069	3 485 013	3 896 363	3 125 826
Waxing Papers (18 Pounds and over)	921 468	1 658 834	1 232 856	1 139 125	1 521 921	1 890 979	3 176 067	3 612 329	4 447 526	4 956 057	5 591 983	6 302 690	4 614 685
Sulphite Bag and Wrapping Papers	1 631 813	2 971 571	2 181 573	1 986 852	2 641 985	3 271 951	5 402 994	6 369 680	5 859 110	3 286 108	2 513 482	2 369 374	1 788 615
Aluminum Foil	32 093	63 191	79 347	93 674	122 929	151 366	251 525	281 932	127 079	123 459	620 379	1 082 181	1 317 807
Cellophane	16 280	29 843	102 323	430 403	644 016	876 993	1 234 808	1 513 491	2 111 757	1 989 680	1 884 131	2 648 278	3 366 068
Cellulose Acetate				168	5 339	17 089	35 806	49 293	89 188	103 470	133 098	133 389	133 982
Pliofilm, Polyethylene, Saran and Cry-O-Rap(b)	Not available prior to 1947											83 994	373 871
Total	4 167 713	6 737 221	5 404 519	5 220 782	6 692 991	7 823 605	12 112 534	14 241 604	15 750 303	14 053 843	14 228 086	16 516 269	14 720 854
Total Du Pont Cellophane Production	14 480	28 950	92 351	372 610	515 324	663 655	920 395	1 121 637	1 596 210	1 521 428	1 430 920	2 025 148	2 629 747
Du Pont Cellophane Per Cent of Total United States Production and Imports of Selected Flexible Packaging Materials	0.3%	0.4%	1.7%	7.1%	7.7%	8.5%	7.6%	7.9%	10.1%	10.8%	10.1%	12.3%	17.9%

NOTES: (a) As defined in this offer.
(b) Combined to avoid disclosure of figures for individual firms.

chart also discloses the progressive steps by which du Pont reduced cellophane prices. These reductions had three main objectives, each an integral part of the competition with the established flexible packaging materials selling at lower prices:

(1) To penetrate packaging markets in which only competitive materials had been used up to that time;

(2) To expand volume in packaging markets in which some cellophane sales had been made;

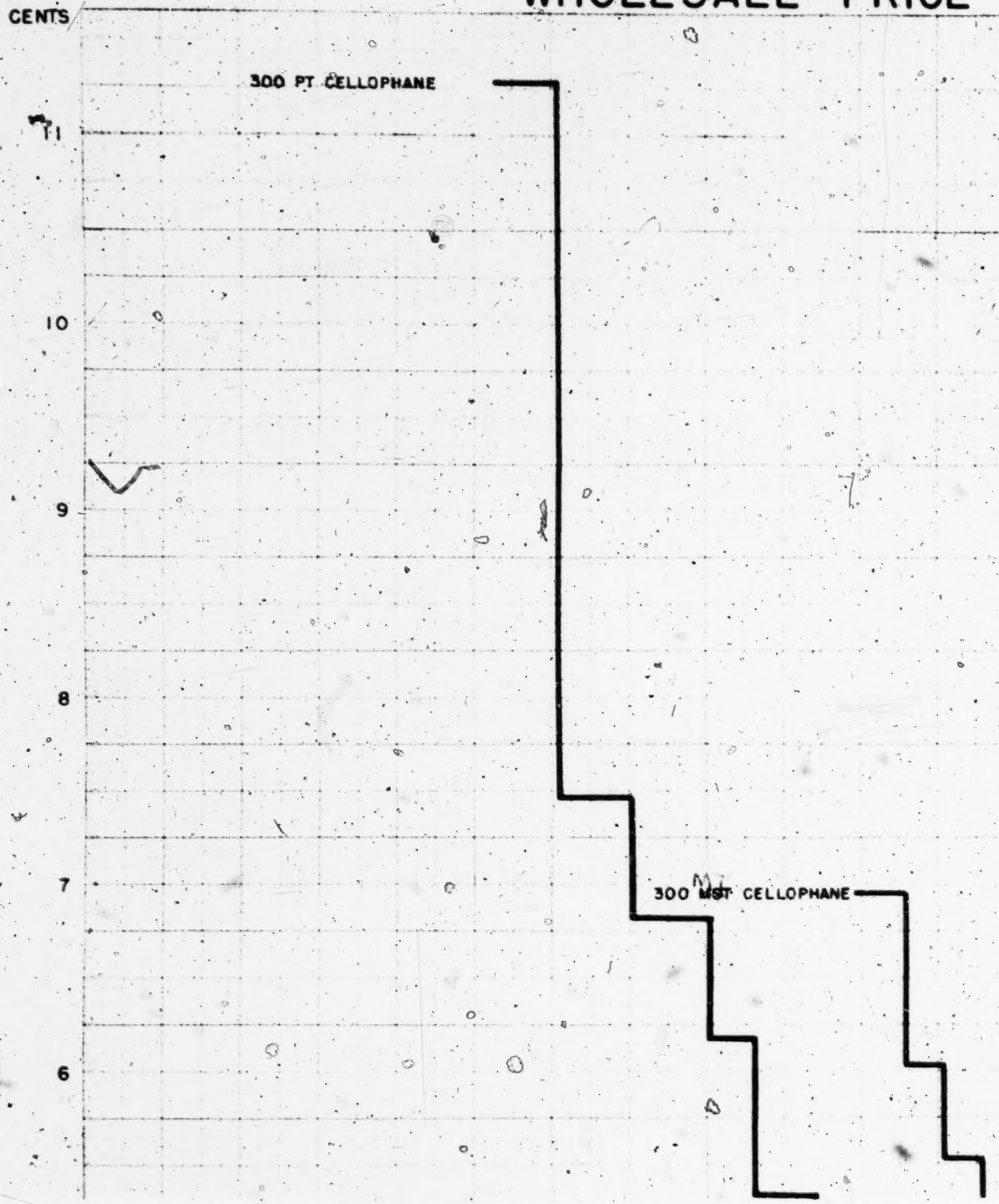
(3) To induce the packaging in cellophane of products either not then packaged in consumer units or packaged in rigid containers.

The price history of the new synthetic films, Polyethylene and Saran, are shown to indicate the comparability of their early price histories with that of cellophane.

WHOLESALE PRICE HISTORIES OF SELECTED FLEXIBLE PACKA

(PRICES IN CENTS PER 1000 SQUARE INCHES)

SOURCE: LEADING MANUFACTURERS
OPA-MPR 567 - NOV. 20, 1944



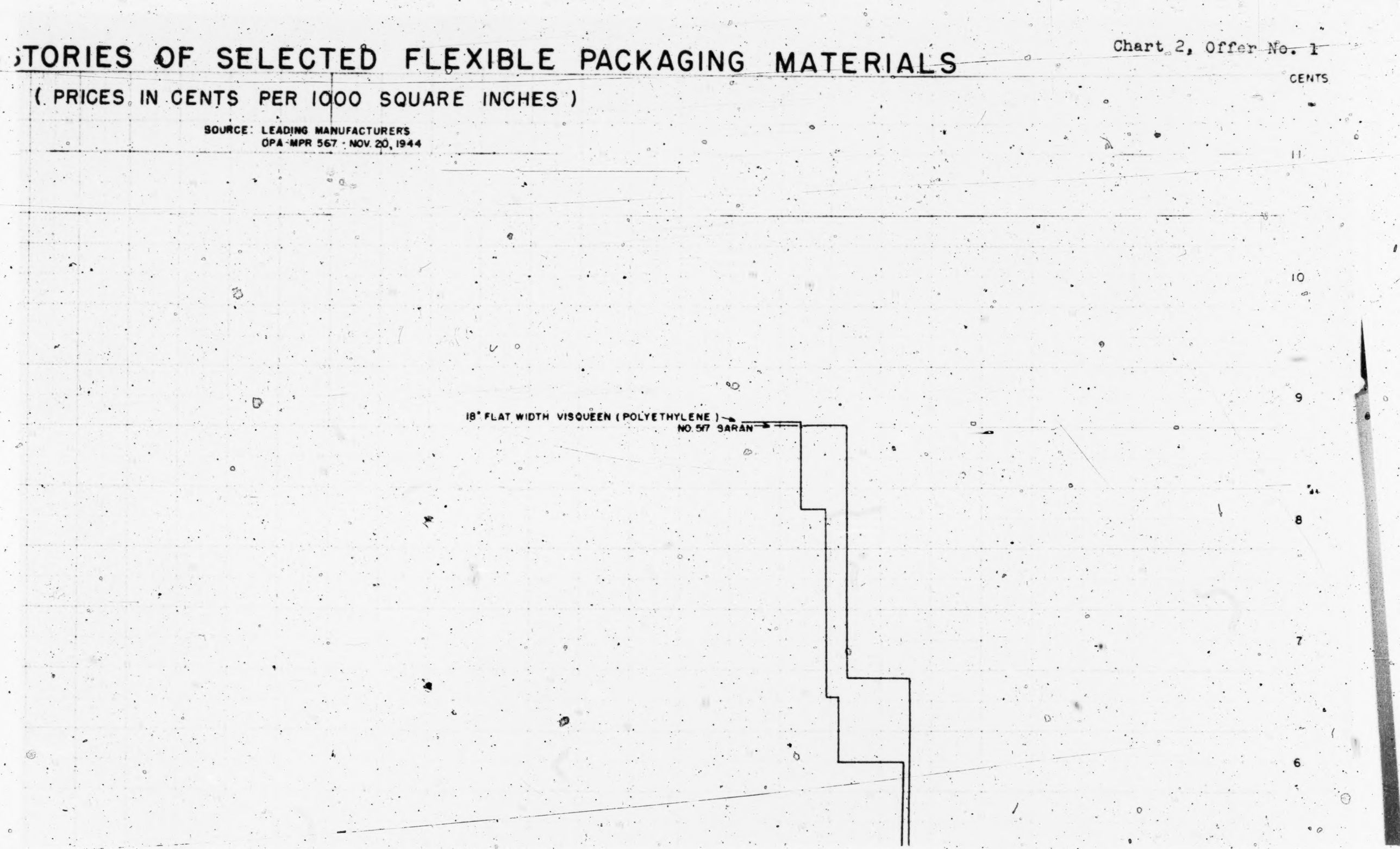
18" FLAT WIDTH VISQUEEN (POLYE

STORIES OF SELECTED FLEXIBLE PACKAGING MATERIALS

Chart 2, Offer No. 1

(PRICES IN CENTS PER 1000 SQUARE INCHES)

SOURCE: LEADING MANUFACTURERS
OPA-MPR 567 - NOV. 20, 1944



1949 wholesale prices, based upon quotations from one principal manufacturer of each material are as follows:

WHOLESALE PRICES OF SELECTED FLEXIBLE PACKAGING MATERIALS
1949 AVERAGE PRICES

Packaging Material	Price per 1,000 sq. in. (cents)	Price per pound (cents)	Yield per pound (sq. in.)
Plain Waxing Sulphite 25# coated Opaque	.7	11.9	17,280
Plain Waxed Sulphite 30# Self-Sealing	1.0	15.0	14,400
Bleached Glassine 25#	1.0	17.8	17,280
Bleached Greaseproof 25#	.9	15.8	17,280
Vegetable Parchment 27#	1.4	22.3	16,000
Aluminum Foil .0003"	1.8	52.2	29,200
Plain Cellophane 300 PT	2.1	44.8	21,300
Moistureproof Cellophane 300 MST-51	2.3	47.8	21,000
Cellulose Acetate .00008"	3.3	82.0	25,000
Pliofilm 120 Gauge N 2	3.8	80.8	21,000
Polyethylene .002" - 18" Flat Width	5.4	81.0	15,000
Saran 100 Gauge #517	6.1	99.0	16,300
Cry-O-Rap	Sold only in converted form. No unconverted quotations.		

Other real price differentials exist in conversion costs, for that part of the trade which is sold through converters. Cellophane is more difficult to convert than most of the other flexible packaging materials, particularly the materials which compete in substantial volume such as glassine and waxed paper. It costs more to convert cellophane than to convert any of the eleven other flexible packaging materials with the exception of polyethylene and Saran which are somewhat more expensive to convert, and pliofilm which costs about the same to convert.

Because of the thinness of its gauge, the fact that it tears easily, and because of the nature of the moistureproofing compositions employed, it is necessary to use special processes in printing cellophane and these are, in many cases, more expensive than the processes which can be used to print glassine and waxed paper.

Prices of flexible packaging materials place cellophane at a price disadvantage as against materials which are sold in largest volume, though cellophane prices are clearly within competitive range of the large-volume competitors.

D. Competitive Promotion and Selling

Manufacturers and converters of such materials, and manufacturers of packaging machinery advertise extensively in various trade publications. Appendix B presents representative advertising found in recognized trade publications for the period 1926 to 1949, illustrating the character and extent of such advertising.

Numerous articles appearing in trade publications relied upon by manufacturers, users and converters of flexible packaging materials recognize the functional interchangeability of cellophane and other flexible packaging materials, the comparability of their composite properties and their substantial interchangeability in actual use. These publications include Modern Packaging, Modern Packaging Encyclopedia, Food Industries, Packaging Parade, Modern Plastics, Quick Frozen Foods, American Management Association Packaging Series, Good Packaging, Paper Trade Journal, and Pre-Pack Age.

As part of its offer of proof, defendant asks the Court to take judicial notice of Modern Packaging and the Modern Packaging Encyclopedia. These publications are standard trade publications for the packaging industry. They are relied on in the regular course of business by all industry groups concerned with packaging. They contain voluminous data showing the functional interchangeability of cellophane and other flexible packaging materials. They also disclose the intense competition between these materials.

The competition of other flexible packaging materials is a cardinal factor in the daily efforts of cellophane salesmen in the field. Submitted herewith as Appendix [illegible] are representative trade reports prepared in the normal course of business by salesmen for du Pont management. These reports emphasize the consciousness of interchangeability on the part of du Pont, its competitors and its customers.

E. Shifting of Business

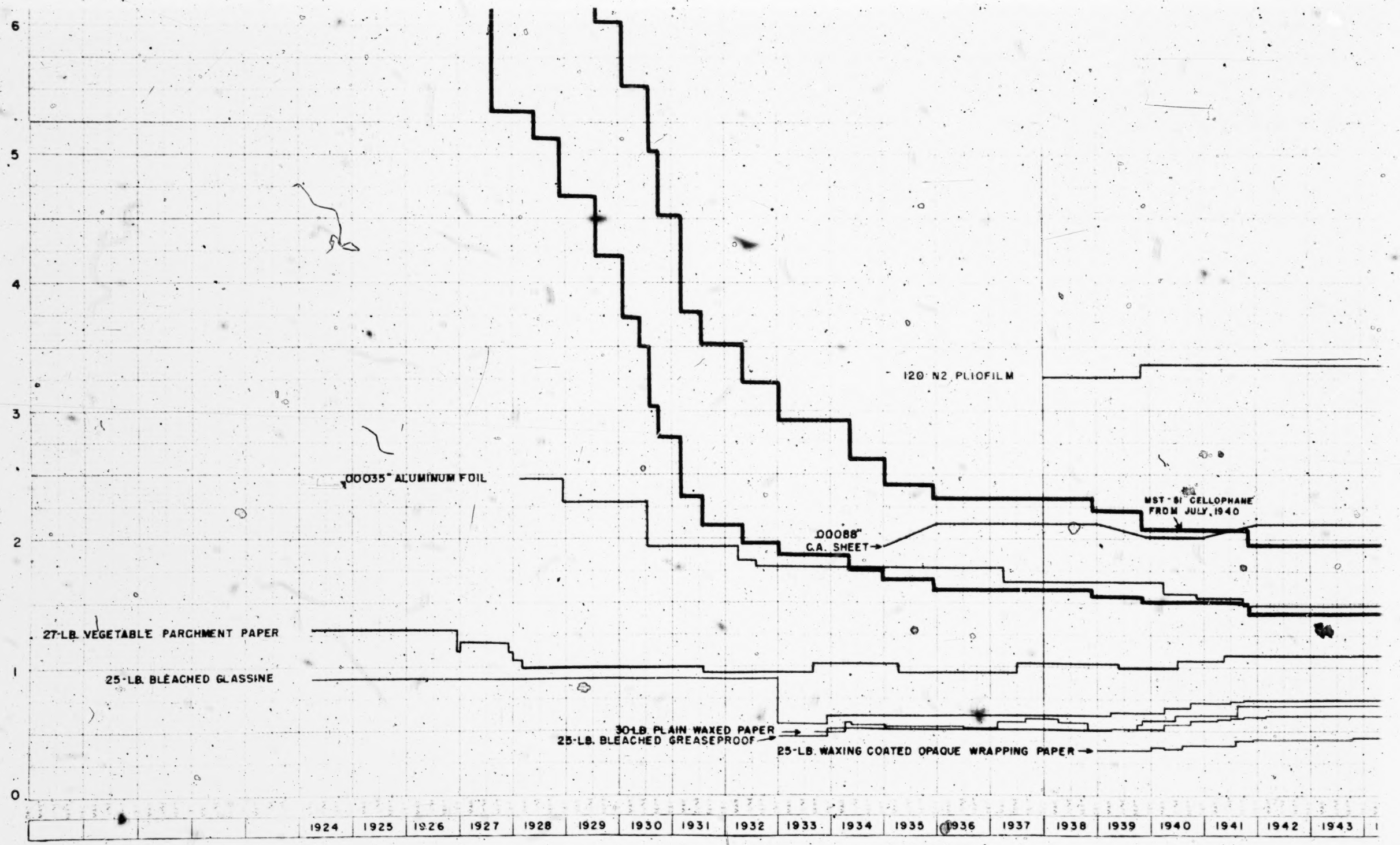
The competition among flexible packaging materials is established by the continual shifting of accounts. Since cellophane is relatively a newcomer to the flexible packaging markets, it has made much of its growth by displacing other materials. On the other hand, other flexible packaging materials have frequently displaced cellophane. This active shifting of business has taken place with respect to the major industry uses for cellophane.

Listed below are examples of accounts which have at one time been packaged in du Pont cellophane, but which had, as of November 1949, been lost to the competitive packaging material shown.* These do not include accounts lost by reason of a shortage of supply of cellophane:

Products and Manufacturer	Packaging Material
Wheat bread Alexander Bros. Baking Co. Topeka, Kansas	Waxed Paper
Variety breads Miller Groceteria Denver, Colorado	Waxed Paper

* The list is representative only.

Products and Manufacturer	Packaging Material
Fruit Cake Ward Baking Co. New York Area	Aluminum Foil
Potato bread Eddy's Association Bakeries Helena, Mont.	Waxed Paper
Sturdi-wheat bread Holmes & Son, Inc. Washington, D. C.	Waxed Paper
White bread Washington Baking Co. Washington, Pennsylvania	Waxed Paper
Standard white bread Liberty Baking Co. Pittsburgh, Pennsylvania	Waxed Paper
Specialty breads Minneapolis & St. Paul Bakers	Waxed Paper and Glassine
Old fashioned white bread Orange raisin bread Regular white bread Holsum Bakeries, Inc. Tampa, Florida	Waxed Paper
Old fashioned white bread Variety breads Palmetto Baking Co. Orangeburg, S. C.	Waxed Paper
Old fashioned white bread Special breads Columbia Baking Co. Atlanta, Ga.	Waxed Paper
Old fashioned bread Holsum Baking Co. Chattanooga, Tenn.	Waxed Paper
Soda & Graham crackers Merchants Biscuit Co. Omaha, Nebraska	Waxed Paper
"Club" crackers Keebler-Weyl Baking Philadelphia, Pa.	Waxed Paper


6
5
4
3
2
1
0
.00035" ALUMINUM FOIL
120 N2 PLIOFILM
MST-81 CELLOPHANE FROM JULY, 1940
.00088" C.A. SHEET
27-LB. VEGETABLE PARCHMENT PAPER
25-LB. BLEACHED GLASSINE
30-LB. PLAIN WAXED PAPER
25-LB. BLEACHED GREASEPROOF
25-LB. WAXING COATED OPAQUE WRAPPING PAPER
1924
1925
1926
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1928
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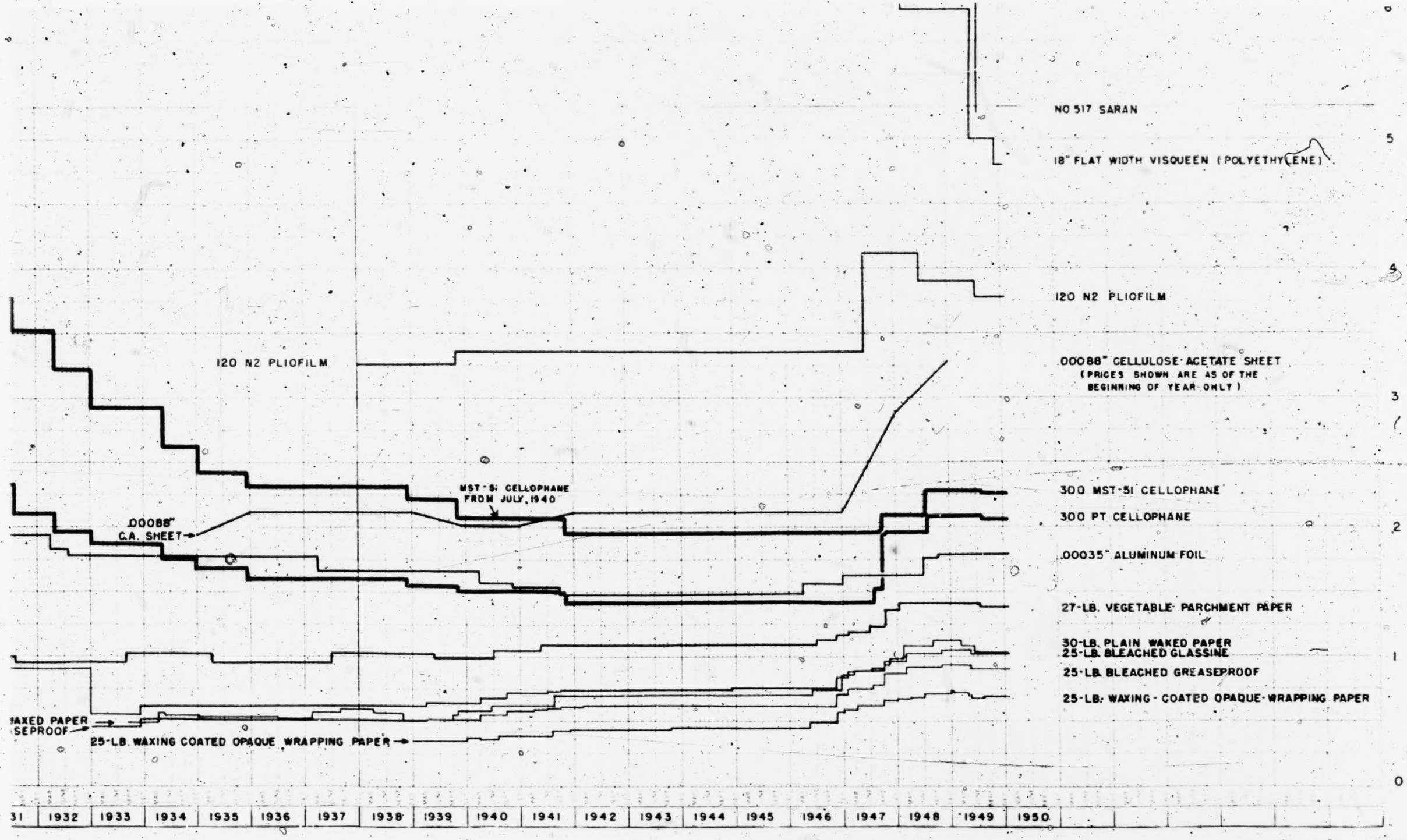

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Products and Manufacturer	Packaging Material
Cookie Pkgs. overwrap Brunner Bros. Chicago, Illinois	Waxed Paper
Princess cracker (carton overwrap) Union Biscuit Co. St. Louis, Missouri	Waxed Paper
Biscuit dough Ballard & Ballard Louisville, Kentucky	Aluminum Foil
Silex coffee Colonial Coffee Co. New York Area	Glassine
Coffee Francis H. Leggett Co. New York Area	Pliofilm
Coffee Swanson Bros. Chicago, Illinois	Sulphite Paper Bags
Candy bars Curtiss Candy Co. Chicago, Illinois	Glassine
Oh Henry candy bars General Candy Co. Chicago, Illinois	Glassine
Stick Gum (printed cellophane) Bowman Gum, Inc. Philadelphia, Penn.	Waxed Paper
Peanut bar Planters Nut & Choc. Co. Suffolk, Va.	Glassine
Mint patties & Zingo Bar Reymer & Bros. Pittsburgh, Penn.	Aluminum Foil
Bubble gum Shelby Gum Co. Shelby, Ohio	Waxed Paper
Peanuts Fisher Nut St. Paul, Minnesota	Glassine

Products and Manufacturers	Packaging Material
Baby Ruth - Butterfinger Candy Bars Curtiss Candy Co. Chicago, Illinois	Glassine
Heath Bar L. S. Heath & Sons Robinson, Illinois	Glassine
Cream cheese The Borden Company New York Area	Aluminum Foil
Cut cheese The Great A & P Tea Co. New York Area	Pliofilm
Cheese curd Kraft Foods Co. Chicago, Illinois	Pliofilm, then Polyethylene
Butter Swift & Company Chicago, Illinois	Vegetable Parchment
Butter Armour & Company Chicago, Illinois	Vegetable Parchment
Butter Sheffield Farms Co. New York Area	Vegetable Parchment
Cheese Swift & Company Chicago, Illinois	Polyethylene Bag

Products and Manufacturers	Packaging Material
Apples The Great A & P Tea Co. New York Area	Pliofilm
Dried Fruit Fowel Bros. Packing Co. Fresno, California	Pliofilm Aluminum Foil
Frozen vegetables (overwrap) Snow Crop Marketeers, Inc. New York Area	Waxed Paper
Frozen foods (overwrap) Pictsweet Foods Mt. Vernon, Washington	Waxed Paper
Deep freeze bags Yorkville Paper Co. New York, N. Y.	Polyethylene
Frankfurters Tobin Packing Co. Rochester, N. Y.	Pliofilm
Turkeys Independance Produce Co. Chicago, Illinois	Cry-O-Rap
Smoked fish Bar Food Products Co. Chicago, Illinois	Pliofilm
Ducks Michigold Duck Farm St. Louis, Missouri	Cry-O-Rap
Turkeys Swift & Co. Chicago, Illinois	Polyethylene Bag
Smoked fish Alaska Salmon & Sales Co. Oakland, California	Pliofilm
Sliced bacon The Great A & P Tea Co. Philadelphia, Penn.	Vegetable Parchment

Products and Manufacturers	Packaging Material
Meat loaves Fried & Reieneman Philadelphia Area	Pliofilm
Potato Chips Kitty Clover Co. Omaha, Nebraska	Waxed Glassine
Potato chips So Good Potato Chip Co. St. Louis, Missouri	Waxed Paper
Potato chips Starland Potato Chip Co. New York Area	Glassine
Popcorn King Kone Corp. New York Area	Glassine
Tobacco packages Christian Paper Co. St. Louis, Missouri	Pliofilm
Cigars (50¢) Max Schwartz (La Pruvadora) New York Area	Sealed Aluminum Foil Tubes
3 cigars Marta Cigar Co. New York Area	Pliofilm Bags
Smoking tobacco - Bugler Brand Brown & Williamson Louisville, Kentucky	Glassine
Cigarettes Brown & Williamson Louisville, Kentucky	Aluminum Foil
Dehydrated Soup Lipton Tea Co. Hoboken, N. J.	Aluminum Foil
Shortening Interstate Cotton Oil Co. Sherman, Texas	Vegetable Parchment

Products and Manufacturers	Packaging Material
Bouillon cubes The Pure Food Company of Mamaroneck New York Area	Waxed Paper, Aluminum Foil
Tea ball cartons National Urn Bag Co. New York Area	Glassine
Cocoa powder Van Houton & Zoon Chocolate Co. New York Area	Laminated Glassine-Foil
Jumbo pudding Taylor Reed Corp. New York Area	Waxed Glassine Envelope
Spinach Sam J. Regas & Sons San Juan Bautista, California	Cellulose Acetate
Tomatoes C. Fava Co. Baltimore, Maryland	Cellulose Acetate
Tomatoes Connecticut Tomatoes, Baum Div. New Haven, Connecticut	Cellulose Acetate
Fresh vegetables - Cello. bags Colonial Stores Atlanta, Georgia	Pliofilm
Pocket size Kleenex Kimberly Clark Corp. Neenan, Wisconsin	Glassine
Textiles Pepperell Mills Boston, Massachusetts	Pliofilm
Camay soap Procter & Gamble Cincinnati, Ohio	Waxed Paper
Doilies Nashua Gummed & Coated Paper Co. Nashua, N. H.	Cellulose Acetate

F. Simultaneous Use of Cellophane and Other Materials

Not only have customers stopped packaging a particular product in cellophane in favor of another flexible packaging material (and vice versa), but manufacturers have sold the identical branded product, at the same time, with some units packaged in cellophane and some packaged in another material. The following list indicates some such manufacturers, the product involved, and the packaging material other than cellophane used at the same time as cellophane on identical units of the product.

Products and Manufacturer	Packaging Material Other Than Cellophane
Pullman Loaf Davidson Baking Co. Portland, Oregon	Waxed Paper
White bread Callen Baking Co. Windber, Pennsylvania	Waxed Paper
Old Home white bread Betsey Ross white bread Goddard Bakers Chester, West Virginia	Waxed Paper
Standard white loaf Harris-Boyer Co. Johnstown, Pennsylvania	Waxed Paper
Standard white bread Lincoln Baking Co. W. Brownsville, Penn.	Waxed Paper

Products and Manufacturer	Packaging Material Other Than Cellophane
Pies Real Pie Bakers Pittsburgh, Pennsylvania	Waxed Paper
Hard candy in bags E. J. Brach Chicago, Illinois	Polyethylene
Candy bags Euclid Candy Co. San Francisco, California	Glassine, Aluminum Foil
Candy pops Del-Rey Candy Corp. Wilmington, Delaware	Aluminum Foil
5¢ peanut package Tom Huston Peanut Co. Columbus, Georgia	Glassine
Crackers Purity Biscuit Co. Salt Lake City, Utah	Waxed Paper
Cheese L. D. Schreiber & Co. Chicago Area	Pliofilm
Cheese Outagami Producers Corp. Black Creek, Wisconsin	Pliofilm
Cheese Tillamook Creameries Tillamook, Oregon	Pliofilm
Oleomargarine Southern Margarine Co. Greenville, S. C.	Vegetable Parchment
Butter National Butter Co. Minneapolis, Minnesota	Vegetable Parchment

Products and Manufacturer	Packaging Material Other Than Cellophane
Frozen foods Cascade Frozen Foods	Waxed Paper
Dried fruit Rosenberg Bros. San Francisco, California	Pliofilm
Sliced bacon Swift & Co. & other meat packers Chicago, Illinois	Vegetable Parchment
Meat Oscar Mayer & Co. Chicago Area	Saran
Pork skins Jordon Food Products Montgomery, Alabama	Waxed Paper
Potato chips Mann Potato Chip Co. Philadelphia, Pennsylvania	Aluminum Foil Bags
Potato chips Gordon-Lay Atlanta, Georgia	Glassine Bags
Popcorn Dali-Fresh Products Tampa, Florida	Waxed Paper Bags
Corn curls Dickey's Vita Sealed Potato Chip Co. New Orleans, La.	Waxed Paper Bags
Tomatoes Thomas Colage Philadelphia, Pennsylvania	Cellulose Acetate
Tomatoes Mariorano & Raggio Philadelphia, Pennsylvania	Cellulose Acetate
Tomatoes American Stores Co. Philadelphia Area	Cellulose Acetate
Slide Fasteners Talon, Inc. Meadville, Pennsylvania	Pliofilm

C. Competitive Sales by End Uses

To establish the extent of interchangeability in specific end uses existing between cellophane and other flexible packaging materials, an analysis was made of the sales records of 19 important converters. These converters account for approximately two-thirds of all converted cellophane and for a substantial portion of all other converted materials. These converters are those with the largest volume who would voluntarily supply the necessary data. These 19 converters are listed below:

American Paper Goods Co.
Benj. C. Betner Co.
Dixie Wax Paper Co.
Dobeckmun Co.
Fabricon Products, Inc.
Forbes Lithograph Mfg. Co.
Kalamazoo Vegetable Parchment Co.
Marathon Corporation
Munson Bag Co.
Milprint, Inc.
Nashua Gummed & Coated Paper Co.
Oneida Paper Products, Inc.
Reynolds Metals Co.
Shellmar Products Corp.
Traver Corporation
Union Bag and Paper Corp.
U. S. Envelope Co.
Waxide Paper Co.
Western Waxed Paper Co.

All but three of these converters (Dixie Wax Paper Co., Kalamazoo Vegetable Parchment Co. and Reynolds Metals Co.) convert cellophane. None is exclusively a converter of cellophane.

This converter study shows that cellophane and other flexible packaging materials are sold through converters in substantial quantities at the same time, to the same classes of customers, for the same end uses. The nature of the converter market for all of these materials appears from

this cross section of it. The study establishes the relative position of cellophane in that market as 20 per cent.

The study was made from records for the year 1949. The results of the study correspond closely to the experience of 1947 and the period since 1949.

In order to point up the variety of materials utilized by each of the 19 converters for major end uses and to make clear that the selection of converters has not been weighted in favor of or against any particular material, the following table (Table 4, Offer No. 1) plots the variety of materials employed by each converter in preparing converted wraps for ten representative end uses. Each of the ten sheets covers a separate end use. Converters are indicated by code numbers 1 through 19, the numbers being assigned at random for each page. In the extreme right-hand column of each page appears the number of converters who use each particular material for each end use.

2118

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Chocolate or Chocolate Coated Candy

Material	Converter																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT				X		X			X			X		X						5
Cellophane MT				X		X			X		X	X		X			X			7
Duplex—Cellophane PT and Cellophane PT																	X			1
Duplex—Cellophane MT and Cellophane MT				X					X	X				X						4
Cellophane MT and Glassine, Window Type									X											1
Foil									X				X		X					3
Foil Laminated to Glassine													X							1
Foil Laminated to Sulphite									X				X							2
Foil Laminated to Tissue									X				X							2
Foil Laminated to Waxed Glassine																			X	1
Foil Laminated to Waxed Greaseproof									X											1
Foil Laminated to Waxed Sulphite									X											1
Foil Laminated to Waxed Tissue									X						X					2
Foil Laminated to Waxed Tissue to Foil									X											1
Glassine	X			X	X				X		X	X		X	X	X				9
Duplex—Glassine and Sulphite												X								1
Duplex—Glassine and Tissue									X											1
Sulphite									X			X								2
Waxed Bleached Sulphite				X							X									2
Waxed Opaque Sulphite				X																1
Duplex—Waxed Tissue and Twisting Tissue				X																1
Sulphite Casein Coated									X											1

5682

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Variety Bread

	CONVERTER																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total
Cellophane PT				X					X			X			X					4
Cellophane MT				X	X	X			X		X	X		X	X	X		X		10
Duplex—Cellophane MT and Cellophane MT									X											1
Cellophane MT and Glassine, Window Type									X											1
Cellophane MT and Sulphite, Window Type												X								1
Foil Laminated to Sulphite									X											1
Foil Laminated to Waxed Tissue									X											1
Foil Laminated to Tissue, Plus Coating									X											1
Glassine	1				X				X			X			X	X				6
Laminated Glassine												X								1
Waxed Glassine												X							X	2
Duplex—Glassine and Kraft												X								1
Triplex—Glassine and Kraft and Kraft																X				1
Duplex—Glassine and Sulphite												X								1
Kraft												X							X	2
Sulphite	X								X			X							X	4
Opaque					X															1
Waxed Kraft																			X	1
Waxed Manila																			X	1
Waxed Bleached Sulphite					X		X				X							X	X	5
Waxed Opaque Sulphite					X													X	X	3
Waxed Clear Transparent Sulphite																		X	X	2
Dry Waxed Kraft												X								1
Pliofilm									X											1

2119

5683

2120

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Cookies and Wafers

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT								X			X						X			3
Cellophane MT		X		X	X		X	X	X		X				X	X	X			10
Duplex—Cellophane MT and Cellophane MT		X					X				X						X			4
Cellophane MT Laminated to Foil																	X			1
Cellophane MT and Glassine, Window Type																	X			1
Cellophane MT and Laminated Glassine, Window Type											X									1
Foil Laminated to Cellulose Acetate							X													1
Duplex—Foil Laminated to Glassine and Bleached Kraft																		X		1
Foil Laminated to Sulphite																	X			1
Foil Laminated to Tissue					X															1
Foil Laminated to Waxed Tissue					X												X			2
Glassine	X										X						X	X		4
Laminated Glassine											X						X			2
Duplex—Glassine and Kraft											X									1
Duplex—Laminated Glassine and Kraft																		X		1
Bleached Kraft																		X		1
Duplex—Kraft and Bleached Kraft																		X		1
Triplex—Kraft and Kraft and Kraft																		X		1
Waxed Bleached Sulphite														X						1
Waxed Opaque Sulphite									X											1
Dry Waxed Kraft																	X			1
Sulphite Casein Coated																	X			1
Polyethylene																	X			1

5684

2120

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Fresh Sausage

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT								X		X	X		X						X	5
Cellophane MT								X		X			X						X	4
Duplex—Cellophane PT and Cellophane PT								X												1
Duplex—Cellophane MT and Cellophane MT	X	X	X					X		X			X						X	7
Cellophane PT Laminated to Manila											X									1
Cellophane MT and Glassine, Window Type								X												1
Foil Laminated to Tissue										X										1
Glassine			X					X												2
Laminated Glassine			X			X														2
Duplex—Glassine and Kraft							X													1
Duplex—Laminated Glassine and Kraft							X													1
Glassine Laminated to Opaque Sulphite		X															X			2
Parchment								X										X		2
Sulphite								X												1
Waxed Bleached Sulphite																	X			1
Waxed Bleached Sulphite																	X	X		2
Cellulose Acetate								X												1
Pliofilm								X				X								2
Polyethylene									X											1

2122

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Ham, Pork Shoulder Butts, and Slab Bacon

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane PT						X				X	X			X	X					5
Cellophane MT						X				X	X			X	X					5
Duplex—Cellophane MT and Cellophane MT															X					1
Triplex—Cellophane PT and Cellophane PT and Cellophane PT															X					1
Cellophane PT and Greaseproof, Window Type															X					1
Cellophane MT Laminated to Pliofilm															X					1
Foil						X														1
Foil Laminated to Sulphite															X					1
Foil Laminated to Tissue						X														1
Coated Glassine															X					1
Greaseproof			X																	1
Kraft			X																	1
Parchment			X												X					2
Waxed Kraft			X																	1
Oiled Paper			X																	1
Pliofilm										X	X				X					3

5686

2128

MATERIALS SOLD FOR REPRESENTATIVE END USES BY CONVERTERS—YEAR 1949

End Use—Powdered Drink Mixes

MATERIAL	CONVERTER																			Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Cellophane MT		X						X								X			X	4
Duplex—Cellophane MT and Cellophane MT			X																	1
Foil Laminated to Glassine	X																			1
Foil Laminated to Waxed Glassine													X							1
Foil Laminated to Cellulose Acetate		X																	X	2
Glassine						X		X	X											3
Opaque Glassine									X											1
Laminated Glassine	X																			1
Duplex—Glassine and Kraft	X																			1
Duplex—Glassine and Bleached Kraft	X																			1
Duplex—Laminated Glassine and Kraft	X																			1
Kraft	X																			1
Sulphite									X											1
Laminated Kraft									X											1
Duplex—Kraft and Bleached Kraft	X																			1
Waxed Bleached Sulphite									X											1
Kraft Laminated to Polyethylene																			X	1
Laminated Pliofilm								X												1
Coated Pliofilm								X												1

5687

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES PRODUCTION OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers (Glassine and Greaseproof: Average basis weight 25# (24 x 36 — 500) Vegetable Parchment: Average basis weight 35# (24 x 36 — 500)	1 540 913	1 996 134	1 791 931	1 566 708	1 750 172	1 609 089	1 995 882	2 407 768	3 115 473	3 594 979	3 484 955	3 894 835	3 125 386
Waxing Paper (18 Pounds and over) (Average basis weight 25# (24 x 36 — 480)	915 979	1 650 785	1 225 205	1 134 375	1 518 841	1 887 050	3 171 776	3 609 823	4 446 441	4 955 017	5 591 799	6 301 030	4 613 560
Sulphite Bag and Wrapping Papers (Average basis weight 35# (24 x 36 — 480)	1 583 707	2 854 183	2 118 393	1 961 339	2 626 053	3 262 699	5 390 490	6 335 338	5 818 664	3 282 246	2 500 925	2 176 705	1 754 676
Aluminum Foil (Average yield 20,000 square inches per pound)	30 864	46 296	61 728	77 160	113 517	136 793	209 479	238 305	123 457	123 457	617 284	1 080 926	1 311 728
Cellophane	14 480	28 950	92 351	429 805	642 932	872 813	1 232 511	1 512 388	2 111 196	1 989 680	1 884 128	2 648 168	3 365 926
Cellulose Acetate				168	5 339	17 089	35 806	49 293	89 188	103 470	133 098	133 389	133 982
Pliofilm, Polyethylene, Saran and Cry-O-Rap (Pliofilm: Average yield 24,000 square inches per pound Polyethylene: Average yield 15,000 square inches per pound Saran: Average yield 16,300 square inches per pound)												83 994	373 871
Total	4 085 943	6 576 348	5 289 608	5 169 555	6 656 854	7 785 533	12 035 944	14 152 915	15 704 419	14 048 849	4 212 189	16 319 047	14 679 129

SOURCES: Figures based on official U. S. Department of Commerce, Bureau of the Census, publications and official U. S. Department of Commerce tabulations certified by the Director, Bureau of the Census. In some years where U. S. Census figures were incomplete, estimates were made based on available official statistics and records of individual companies kept in the normal course of business.

Average basis weights of wrapping papers obtained from Dr. Louis T. Stevenson, Economist, American Paper and Pulp Association. Average yield per pound for Aluminum Foil, Pliofilm, Polyethylene and Saran obtained from the manufacturers of these packaging materials. Cellophane, Cellulose Acetate and Cry-O-Rap manufacturers reported production in both pounds and square yards.

POSITION OF DU PONT CELLOPHANE IN UNITED STATES MARKET OF SELECTED FLEXIBLE PACKAGING MATERIALS BIENNIALLY 1925 TO 1949 INCLUSIVE

Comparison of Total Du Pont Cellophane Production with Total United States Production and Imports of Selected Flexible Packaging Materials

(Figures in M Square Yards)

	1925	1927	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
TOTAL UNITED STATES IMPORTS OF SELECTED FLEXIBLE PACKAGING MATERIALS													
Glassine, Greaseproof, and Vegetable Parchment Papers[a] (Glassine and Greaseproof: Average basis weight 30# (24 x 36 — 500)[b] Vegetable Parchment: Average basis weight 35# (24 x 36 — 500))	25 146	17 648	16 489	3 852	6 629	6 132	15 452	7 111	170	90	58	1 528	440
Waxing Paper (18 Pounds and over)[c] (Average basis weight 25# (24 x 36 — 480)	5 489	8 049	7 651	4 750	3 080	3 929	4 291	2 506	1 085	1 040	184	1 660	1 125
Sulphite Bag and Wrapping Papers[d] (Average basis weight 35# (24 x 36 — 480)	48 106	117 388	63 180	25 513	15 932	9 258	12 504	34 342	40 446	3 862	12 557	192 669	33 939
Aluminum Foil (Average yield 20,000 square inches per pound)	1 229	16 895	17 619	16 514	9 412	14 573	42 046	43 627	3 622	2	3 095	1 255	6 079
Cellophane[e] (Average yield 20,000 square inches per pound)	1 800	893	9 972	598	1 084	4 180	2 297	1 103	561	—	3	110	142
Cellulose Acetate[f]													
Pliofilm, Polyethylene, Saran and Cry-O-Rap[g]													
Total	81 770	160 873	114 911	51 227	36 137	38 072	76 590	88 689	45 884	4 994	15 897	197 222	41 725

NOTES: (a) Includes "Grease-proof and imitation parchment paper, super calendered and transparent (include glassine paper)", "Vegetable parchment paper by whatever name known", and "Grease-proof and imitation parchment paper, n.s.p.f.)".

(b) Average basis weight for glassine and greaseproof papers figured at 30# (24 x 36 — 500) to account for any heavier than U. S. production paper which might have been imported under this classification.

(c) Listed as "Paraffined or wax-coated paper" and includes "Bags and articles of surface-coated, parchment or similar papers".

(d) Includes M.G. and M.F. Sulphite wrapping and "Other wrapping, n.e.s." "Other wrapping, n.e.s." has been reduced 10% to eliminate non-competitive wrapping papers.

(e) Listed as "Cellulose products, n.e.s.: Sheets, bands, and strips of transparent cellulose film exceeding 1 inch in width but not exceeding 3/1000 inch in thickness made from cellulose, except cellulose acetate". Excludes converted film such as bags, etc., for which only dollar figures are available.

(f) Cellulose acetate omitted from this schedule because film is not reported separately.

(g) No imports reported.

SOURCES: Figures based on an official U. S. Department of Commerce Schedule, certified by the Director, Bureau of the Census, entitled "Imports for Consumption of Certain Materials Suitable for Wrapping 1923-1949". Average basis weight of wrapping papers obtained from Dr. Louis T. Stevenson, Economist, American Paper & Pulp Association. (See Note (b). Average yield per pound of Aluminum Foil and Cellophane obtained from the manufacturers of these packaging materials.

Tables 7 and 8 show that du Pont's percentage has increased since 1925. Even as of 1949, however, du Pont cellophane was still a small per cent of the total.

Total production and imports in 1949, as shown in Table 7, was 573,010 tons. Of this total, combined cellophane production by du Pont and American Viscose Company was only 114,419 tons. Du Pont's cellophane production (89,333 tons) was 15.5% of the total 1949 production and imports of the eleven materials and cellophane. Production and imports of waxing papers alone (180,276 tons) represented 31.2%; glassine, greaseproof and vegetable parchment papers combined (125,451 tons) represented 21.7%. Because of cellophane's greater area per pound, du Pont's market position in 1949 on an area basis was 17.9%, as shown in Table 8.

Du Pont, by reason of its manufacture of cellophane or otherwise, does not have a dominant position in that part of trade and commerce represented by flexible packaging materials which are sold at the same time, to the same classes of customers, for the same end uses, and which are in all material respects functionally interchangeable in the market as to price, quality, and supply. Du Pont does not have the power to control the price at which flexible packaging materials are sold, the quantity of

flexible packaging materials produced, or the quality of such materials. Du Pont does not dominate the sale of flexible packaging materials to any particular major end use. All users of flexible packaging materials receive the benefits of free and open competition between the various manufacturers of such materials and between converters of such materials, and there is active, intense and continuing competition as to price, quality, and terms and conditions of sale.

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AGREEMENT

BETWEEN:

1) SYLVANIA INDUSTRIAL CORPORATION, a corporation organized under the laws of the State of Delaware, hereinafter called "American Company) and herein represented by its president, Mr. Roger Wallach, of the first part,

2) LA SOCIETE INDUSTRIELLE DE LA CELLULOSE, called "SIDAC" having its principal office at Ghent, hereinafter named: "SIDAC", herein represented by three of its directors: Messrs. Van Ham, Vleurinck and Van Campenhout, of the second part,

3) La COMPAGNIE INTERNATIONALE DES INDUSTRIES CHIMIQUES, "INTERCHIMIC" having its principal office in Brussels, hereinafter called "INTERCHIMIC", herein represented by three of its directors: Messrs. Van Ham, Vleurinck and Van Campenhout, of the third part,

WITNESSETH:

Article I

It is set forth that Sidac manufactures a cellulosic product sold under the name of transparent Sidac paper and in America under the name "Fenestra"; Sidac possesses certain patented inventions or inventions for which Letters Patent have been applied for, as well as certain special or secret manufacturing processes. All these patented inventions or applications for Letters Patent and processes and secret methods, as well as all improvements thereto and which may hereafter be effected by the Sidac Company, will be hereinafter designated by the word: "Processes".

Article 2

The Sidac Company sells, cedes, transfers and grants to the American Company, under conditions and terms to be hereinafter stipulated, without additional remuneration, the exclusive right to use the said "processes" above mentioned, in all the North American continent,

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north of the Panama Canal, in all the possessions of the United States of America and the Republic of Cuba; The Sidac Company will furnish to the American Company all detailed plans and specifications; will co-operate completely and continuously with the American Company for the erection of its factory or factories; will deliver all necessary machines, material and accessories and will supervise the setting up; Sidac will furnish at all times to the American Company technical counsel, the material and assistance which the said company might request, including the services of its management personnel for the setting up and beginning of regular operation of the factories, and this during the time deemed necessary by the American Company. Travelling expenses and regular emoluments for the management personnel and employees of Sidac will be charged to the American Company during the trip and the stay in America required by the American Company, and this from the date of departure until return to the factory in Ghent of the said personnel. Machines and material will be sold by Sidac at cost exclusive price, increased by five (5%) per cent. Sidac will grant the right to the American Company to sell Sidac products coming from American factories in all the territory hereinabove mentioned, as well as Sidac products manufactured in Belgium, for the Republic of Cuba and the American possessions not included in the Birn & Wachenheim contract, and this, from this date.

There exists a contract (called Birn & Wachenheim contract) of which Mr. Wallach has knowledge, for exclusive sale rights of Sidac products in North America, north of the Panama Canal; Sidac will obtain the cancellation of this contract with its corresponding rights, as soon as possible; Sidac shall in no case, grant an extension of this contract; in all cases, Sidac shall grant the rights stipulated in this contract to the American Company, for North America; north of the Panama Canal and this, upon expiration of the contract now in force. Beginning of 1930, Sidac will limit its sales in America to the minimum imposed by said contract, that is, to the equivalent of eight million square meters of paper of 33 grams per square meter, per year. The American Company agrees not to sell these products outside of the territory above named.

However, an arrangement may be agreed upon later, between Sidac and the American Company to bring about changes deemed useful and profitable to both parties, in the Birn & Wachenheim contract and to the clauses above stipulated, but such changes may be made only with the consent of the American Company.

ARTICLE 3.

If, at any time, Sidac were to grant to an individual, a firm or a company, the right to use its "processes" in other countries, Sidac will impose upon the grantee the obligation not to use the said processes either for manufacture or sale, directly or indirectly, in the territory ceded exclusively to the American Company.

ARTICLE 4.

Sidac will immediately inform the American Company of any new discovery or invention or improvement brought to the Sidac products, or any change thereto, as well as of any new products which may be discovered or improvements to the "processes, and Sidac will furnish all details to the American Company. The president of the American Company and the employees design ted and delegated by him, under his responsibility, will have the right to visit the factory or factories of Sidac to familiarize themselves with the processes, methods, inventions and developments. Sidac will inform the president of the American Company or one of the persons designated and delegated by him, of the use and application of its methods and processes. Sidac will inform the president and the American Company of any new discovery, and as soon as same is discovered and ready for operation.

The American Company will acquaint with and inform Sidac of all discoveries or new processes which it may effect and will accord to Sidac the same rights and advantages as those stipulated above in her favor.

Exchanges of improvements in machines or processes, as well as processes for novel uses of similar products or articles, whether they be patented, patentable or not, will be effected gratuitously between Sidac and the American Company for the territories which they will work respectively, the only expense for each, being reimbursement of patent expenses for the countries in which the patents are employed.

For all countries where Sidac holds similar provisions as this, for the granting of its patents and processes, a license will be paid by the American Company to the foreign company, or vice versa, for any invention which is supported by a patent. In case both companies cannot agree as to the rate and manner in which the royalties for said license will be paid, the president of Sidac will arbitrate as a last resort and without appeal.

Sidac accepts the obligation to remit, transmit and transfer to the American Company all patents or patent applications that have been or will be granted thereafter by any country of the continent of North America, north of the Panama Canal, by the Republic of Cuba or any other American possession; to confer to the American Company at the same time, the exclusive right to use its "processes" and to manufacture, produce and sell the product or products and sub-products obtained by the use of these "processes" on the continent of North America, north of the Panama Canal, in the possessions of the United States and the Republic of Cuba.

ARTICLE 5.

The Sidac company guarantees that its processes do not infringe upon any existing American patents or processes protected in America, and to protect the American Company from any infringement litigation.

ARTICLE 6.

As remuneration for the sale, transfer and cession of rights, patents and processes indicated in the present contract, the American Company will issue or transfer to Sidac, the following shares, taken from its present authorized total of 450,000 ordinary shares, all having equal rights as concerns voice and attribution of dividends, etc...

a) 100,000 shares as remuneration for above patents and patent applications;

b) 100,000 shares as remuneration for:

I° - granting to the American Company the exclusive right to manufacture and sell the said products in the above-mentioned territories;

2° - for disclosing to the American Company secrets of manufacture, as well as all other rights and privileges granted to the American Company by Sidac in the present contract;

3° - intervention by Interchimie and others in subscription of the capital, any bonuses on shares, to be disbursed under this heading, to be charged to Sidac.

ARTICLE 7.

Of the 250,000 remaining shares of the American Company, it is understood that 200,000 only have been or will be issued presently, 50,000 to be kept for future eventual needs.

La COMPAGNIE INTERNATIONALE DES INDUSTRIES CHIMIQUES, "Interchimie" intervening party of the third part, will subscribe at the rate of $ 17.50 per share for such part of shares as are not elsewhere sold at the minimum price of $ 17.50 per share.

ARTICLE 8.

The contracting parties agree to name Mr. Roger Wallach, actual president of the American Company, and two representatives of the Compagnie Internationale des Industries Chimiques and one representative of Sidac, as directors of the American Company. The directors thus named will elect Mr. Wallach as president of the American Company. It is understood that during the duration of his tenure of office, that is, ten (10) years, Mr. Wallach will be re-elected director and president, and this in the American meaning of the word, namely, manager.

ARTICLE 9.

Mr. Wallach will be under obligation to give all the necessary time, work and energy, as well as his knowledge to the administration of the affairs of the American Company. In order to assume these new duties, he will resign from his position as Manager of the Grasselli Dyestuff Corporation and General Dyestuff Corporation as soon as possible.

ARTICLE 10.

The present agreement and obligations undertaken by the parties are for the duration of a period of thirty (30) years, for themselves, their heirs or eventual successors and assigns, even if one or the other of the parties, in any manner, were to transfer to another company or organization, any change occurring in the status of one or the other of the parties to be made on condition

that the reciprocal rights and obligations stipulated in the present contract remain in full force and vigor.

Made in seven copies and in good faith,
at BRUSSELS, the 15th of April, 1929.

signed:

Roger Wallach

L.W. Van Campenhout

Léon Van Ham

Achille Vleurinck

translation
of

S.I.D.A.C. - AMERICAN COMPANY AFFILIATION - PARTICIPATION BY LA CELLOPHANE:

"Vice-President B. M. May orally reported upon his discussions with La Cellophane in Paris during March, 1930, on the subject of reparations to DuPont Cellophane Company resulting from the settlement of the difficulties between La Cellophane and the Belgian S.I.D.A.C. (Societe Industrielle de la Cellulose, Ghent, Belgium).

In the settlement La Cellophane is to receive in reparations stock of the Belgian S.I.D.A.C., which in turn owns stock in the Sylvania Industrial Corporation of America. La Cellophane would, therefore, have an indirect interest in the Cellophane business in this country, whereas under the sale of their patents and "know how" to us in 1928 it was agreed that La Cellophane would not engage in such business with others in North America.

Under the circumstances, it was necessary in a spirit of fairness to permit La Cellophane to accept the stock of the Belgian S.I.D.A.C., provided such consent upon our part brought with it concessions to us.

Proceeding upon the above basis, Mr. May stated to La Cellophane that he would submit to his Board of Directors the following proposition, made by La Cellophane subject to approval of its Board of Directors, viz:

DuPont will approve La Cellophane accepting stock in the Belgian S.I.D.A.C. under the following conditions:

(a) That La Cellophane will undertake to do its best to prevent technical information, patents and other data furnished by DuPont, to La Cellophane and/or its licensees from going directly or indirectly to the Belgian [illegible] or its affiliated companies, particularly the Sylvania Industrial Corporation;

(b) That, as applied to Non-Moistureproof Cellophane, DuPont shall have equal rights with La Cellophane in Japan and South America, and also in China, provided La Cellophane obtains rights in the last named country;

(c) That in the event of any happening that may result in the elimination of any of the existing companies, except La Cellophane, DuPont Cellophane is to receive always rights equal to those of La Cellophane in the specified countries;

(d) That DuPont shall have equal rights with La Cellophane in South America and/or Japan on Moistureproof Cellophane;

(e) That DuPont shall have the option to participate upon the same terms and conditions as La Cellophane in any undertaking to build plants in Japan and/or South America.

After detailed discussion of the subject in all its aspects, the Board unanimously gave its approval to the arrangement as outlined, and instructed Mr. May to so inform La Cellophane."

I hereby certify that the above is a true extract from Minutes of Meeting of the Board of Directors of the DuPont Cellophane Company, Inc., held on May 8, 1930.

F. [illegible]
ASS'T. SECRETARY.

1.

COUNTY OF NEW YORK)
STATE OF NEW YORK)
UNITED STATES OF AMERICA)

On this 13th day of May, 1930, there personally appeared before me, a Notary Public in and for the County and State aforesaid, F. G. Hess, who did depose and say that he is an Ass't. Secretary of the DuPont Cellophane Company, Inc., that the above is a true extract from the Minutes of Meeting of the Board of Directors of that Corporation, held on May 8, 1930, and that the seal affixed is the official seal of said Corporation. Given under my hand and seal this 13th day of May, 1930.

Notary Public
WESTCHESTER COUNTY
New York County Clerk's No. 047
New York County Reg. No. 1W 2[illegible]
Commission expires March 30th, 1931

J. MASON WILLIAMS
NOTARY PUBLIC.

APPROVED AND ACCEPTED BY

La CELLOPHANE, SOCIETE ANONYME,

by

DX 1004

cc: Mr. J. E. Matt - N.Y.
Mr. P. C. Hess - N.Y.
Messrs. M. duP.Lee-E.K.Gladding,Bfl

March 2, 1937 DX1004

4/24/51

Dr. Wade, Patent Department
Sylvania Industrial Corporation
122 E. 42nd Street
New York, New York

Dear Sir: Du Pont-Sylvania Cross License - Hunter U.S. No. 2,062,179 - Morgan U.S. No. 2,045,860

In accordance with the results of our discussion in the above subject, we are pleased to send you herewith the original and duplicate original of a cross licensing agreement which we have prepared. While we cannot guarantee that the agreement will be executed in its present form by our Company, we have discussed it sufficiently so that we anticipate no difficulty along this line. Consequently, if it meets the approval of your Company, we suggest that you arrange for execution of these copies returning them to us for completion in the usual fashion.

You will note that the license grants are reciprocal, permitting the licensees to make, use, and sell the products described in the claims in the respective patents with the right to sub-license customers to use the light protective film in the making of articles comprising this film and described and claimed in the patent throughout the United States of America, its territories and dependencies, the said customers, however, being permitted to sell the said articles anywhere.

We would direct your attention especially to Article 7 of the agreement which provides that the licenses shall be royalty free and unrestricted except as provided for in the instant agreement and as provided for in the agreement of April 26, 1933 existing between our Companies. Thus, it will be understood that an ultra-violet light protective wrapper which is also moistureproof will not by virtue of the royalty-free license granted herein for the light protective wrapper feature be exempt from the royalty provisions of the agreement of April 26, 1933.

You will note also that we have omitted mention of a license under Joseph U.S. patent No. 2,038,114. It was our understanding, however, that you would investigate the rights of Sylvania to license du Pont under the Joseph patent and

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if such rights were available, a license under Joseph would be included in the present agreement. We shall appreciate your advice as to whether or not this agreement should be modified to take care of this provision.

The remainder of the agreement appears to be self-explanatory and we shall be pleased to hear from you regarding its approval or any comments you may have relative thereto.

Very truly yours,

TECHNICAL DIVISION

W. [illegible] Smith
Patent Service

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WWS:aW
Encl.
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AGREEMENT made this day of 1937, in the City, County and State of New York, by and between E. I. DU PONT DE NEMOURS AND COMPANY, a corporation organized and existing under the laws of the State of Delaware, and having its principal place of business at Wilmington, County of New Castle and State of Delaware, (hereinafter called DU PONT) and SYLVANIA INDUSTRIAL CORPORATION, a corporation organized and existing under the laws of the State of Virginia, having its principal place of business in New York, New York, (hereinafter called SYLVANIA);

WITNESSETH:

WHEREAS, DU PONT is the owner of the entire right, title and interest in and to Hunter U. S. Patent No. 2,062,179, issued November 24, 1936 for Articles of Manufacture; and

WHEREAS, SYLVANIA is the owner of the entire right, title and interest in and to Morgan U. S. Patent No. 2,043,860, issued June 9, 1936 for Preservation of Substances, and

WHEREAS, SYLVANIA desires to obtain a license under said Hunter Patent, and DU PONT desires to obtain a license under said Morgan Patent;

WHEREAS, the agreement dated April 26, 1933 between SYLVANIA and Du Pont Cellophane Company, Inc., does not provide for the licensing of the parties under said Hunter and Morgan patents;

NOW THEREFORE, in consideration of the full and faithful performance by the parties hereto of the covenants set forth hereinafter, it is mutually agreed as follows:

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1. DU PONT hereby grants to SYLVANIA a non-exclusive, non-assignable, license to practice the inventions and to make, use and sell the products described and claimed in said Hunter U. S. Patent No. 2,062,179, or reissue or extension thereof, throughout the United States of America, its territories and dependencies, said license to SYLVANIA including the right in SYLVANIA to sublicense its customers to use ultra-violet light protective film of the character defined in the claims of said Hunter patent, in the making of articles comprising said film and described and claimed in said Hunter patent or reissue or extension thereof, throughout the United States of America, its territories and dependencies, and to sell said articles.

2. SYLVANIA hereby grants to DU PONT a non-exclusive, non-assignable license to practice the inventions and to make, use and sell the products described and claimed in said Morgan U. S. Patent No. 2,043,860 or reissue or extension thereof, throughout the United States of America, its territories and dependencies, said license to DU PONT including the right in DU PONT to sublicense its customers to use ultra-violet light protective film of the character defined in the claims of said Morgan patent, in the making of articles comprising said film and described and claimed in said Morgan patent or reissue or extension thereof, throughout the United States of America, its territories and dependencies, and to sell said articles.

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3. SYLVANIA will apply to products sold under the license granted to SYLVANIA herein, the legend "Licensed under U. S. Patent No. 2,062,179", and will impose on its sublicensees the obligation to apply the same legend to articles made and sold by said sublicensees and described and claimed in said Hunter U. S. Patent.

4. DU PONT will apply to products sold under the license granted to DU PONT herein, the legend "Licensed under U. S. Patent No. 2,043,860", and will impose on its sublicensees the obligation to apply the same legend to articles made and sold by said sublicensees and described and claimed in said Morgan U. S. Patent.

5. No right or license is granted to SYLVANIA, by virtue of this agreement, under any patent owned by DU PONT except said Hunter U. S. Patent No. 2,062,179, or reissues or extensions thereof.

6. No right or license is granted to DU PONT, by virtue of this agreement, under any patent owned by SYLVANIA except said Morgan U. S. Patent No. 2,043,860, or reissues or extensions thereof.

7. Except for the provisions relative to the payment of royalty and contained in said agreement dated April 26, 1933 between SYLVANIA and the Du Pont Cellophane Company, Inc., the licenses granted herein shall be royalty-free. It is furthermore agreed that the licenses granted herein shall be unrestricted except as provided for in this agreement, and except as provided for in said agreement dated April 26, 1933.

8. The licenses granted herein shall inure to the benefit of and be binding upon the successors of the entire non-fibrous wrapping tissue business of the parties to this agreement.

IN WITNESS WHEREOF the parties hereto have caused these presents to be signed by their respective proper signatories and their respective corporate seals to be hereunto affixed on the day and year first above written.

COPY

E. I. DU PONT DE NEMOURS & COMPANY

ATTEST: By _____

_____
Secretary

PENNSYLVANIA INDUSTRIAL CORPORATION

ATTEST: By _____

_____
Secretary President

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D.X. 1006

(1)

NARRATIVE SUMMARY OF DEPOSITION OF WILLIAM C. JAKES

Taken December 10, 1951 at Chicago, Ill.

William C. Jakes resides in Evanston, Illinois, and his office is in Chicago (3). He is Vice President in Charge of Production of the Curtiss Candy Company, and has been with Curtiss more than 20 years. He began in sales promotional work and remained in that work for about three years, then transferred to production, including the packaging of the Company's products (3, 4).

Curtiss sells candy, chewing gum, nuts, marshmallows, cookies, popcorn, pretzel sticks, muffin mix, soup mix, pancake mix, corn poppins, French fried potatoes and potato chips (4, 55-56). Total Curtiss sales for 1950 were approximately $55,000,000 (5).

More than 50% of the Company's sales are in the form of bar candy (5, 48). Curtiss' principal bars are "Baby Ruth", "Butterfinger", and "Coconut Grove". The individual wrap for each bar consists of a sulphite paper liner with an outer wrap of printed glassine (5).

About 15 years ago, in response to pressure from the Sales Division, and following similar action by other companies, Curtiss changed the wrap of its entire bar line to a sulphite liner with a printed cellophane outer wrap. The reason for the change was the belief that the cellophane dress-up would have a sales appeal and a sales advantage. (2)

The same general design and color were retained, but the effect was not the same as the white paper with the red

"Baby Ruth" on it (5, 6). Within one to two years Curtiss shifted back to a glassine outer wrap at the insistence of the Sales Division, because the wrapper, particularly in the case of "Baby Ruth" bars, had become so well associated with the bar that customers and retailers complained of the change (6, 7). Curtiss' experience is that there is a consumer preference for glassine as against other wrappers on candy bars (29). At that time cellophane was higher in price than glassine, but gave better protection to the product (7). Today glassine does not give adequate protection as a wrapper for the candy bar and Curtiss would prefer more protection (7-8). A number of candy bar makers changed from a glassine to a cellophane wrap at about the same time as Curtiss, and the reversion to glassine was also on a wide basis (69). Curtiss has not used cellophane as a wrap for individual candy bars since that time (8).

Curtiss' only reason for changing back to glassine from cellophane as an outer wrap for candy bars was consumer preference (48-49). The combination of the glassine wrapper, combination of colors, and shape of the package had an established preference, and any wrapper other than glassine would have run into difficulty from a merchandising point of view (49). No chocolate five-cent candy bar with large national sales is wrapped in cellophane (49). The (3)
smearing of chocolate in warm temperatures was not a disadvantage of a transparent wrap for Curtiss, since it used a liner paper under either cellophane or glassine for wrapping chocolate bars (50). The tendency of chocolate to discolor in cold temperature is a deterrent to using a trans-

parent wrap on a chocolate bar (50-51). Some chocolate bars are packaged in a boat slightly larger than the bar, and a transparent wrap used without a liner would show the bar size (51-53). Several manufacturers make the same type of bar, similar in appearance. Differentiation is accomplished by the wrap, trade name, flavor, quality and value (53). Transparent wraps would reduce the differentiation of distinctive dress and trade name between two bars that looked alike (54). Inexpensive chocolate candy bars do not lend themselves to direct wrapping in a transparent material (54). When Curtiss used a cellophane wrap for candy bars, the bar was not visible because of the opaque liner, and there was extensive printing on the cellophane (71-72). Most of the cellophane wraps on candy bars had either a liner or extensive printing though a few were completely transparent (72-73).

About 1948, Curtiss put out a package of six Baby Ruth bars in a cellophane bag. This use of cellophane was discontinued in 1950 because the price of cellophane was higher than glassine, and the bag did not lend itself to good display. Curtiss' six-bar package is now a printed chipboard box with an open front to display the contents (8, 9).
(4)

Curtiss uses the following flexible wrapping materials: Glassine, cellophane, pliofilm, foil, kraft paper and cellulose acetate, and small amounts of greaseproof paper. Cellophane constitutes not more than 10% of the total (9, 10, 28).

The five-cent chewing gum pack was originally packaged with the individual sticks being wrapped in wax paper banded with printed glassine, and overwrapped with a

printed paper of some type. Later for a number of years the package was overwrapped with cellophane. The current package is overwrapped with an opaque printed foil cellophane laminate, the individual sticks still being in wax paper banded with printed glassine (11). The one-cent chewing gum pack has always been wrapped in wax paper banded with printed paper covering three sticks (11, 12).

Lollipops were originally wrapped individually in plain wax paper. Later they were handwrapped individually in printed cellophane. Curtiss' current package for the individual lollipop is like a small bag with unprinted cellophane for the front and printed glassine for the back. The cellophane gives transparency and moisture protection to the product, and the printed glassine identifies the product. This combination package is used because it costs less than printed cellophane (12).

Curtiss' small consumption package of nuts was originally printed wax paper bags, and more recently almost exclusively pliofilm, because it has greater moisture resistance than cellophane. Curtiss' large take-home half-pound package of nuts is a double-walled cellophane bag. In the store this size is less exposed to moisture and drafts, and is (5)
not displayed as long. Pliofilm is more expensive than cellophane (13, 58, 59, 73).

Curtiss' one-cent caramel rolls are wrapped in printed wax paper. Its square caramels are wrapped in unprinted cellophane. These are sold by the pound, or two or three for a penny, and also Curtiss packages some in one pound boxes with acetate windows, and in bags. One-cent caramel rolls in wax paper compete with the cellophane-wrapped caramels (13, 14, 28, 71).

Roll mints are wrapped in foil covered with a printed paper band. The paper band has been improved so that it has a very fine finish which was not available years ago. It is more costly than it was before, but provides luster in appearance, and a wax seal for moisture protection (14).

Cookies were originally wrapped in printed cellophane bags in about 1943 (14). Beginning last year the package was changed to a printed box overwrapped with unprinted cellophane to give better protection in shipping and handling by using boxes, and the cellophane overwrap to provide brilliancy of color and sales appeal along with moisture protection. Cookie sandwiches are sold three to a package in a unit wrapped in cellophane (14, 15).

Peppermint patties were wrapped originally in foil, later in printed glassine, then in unprinted cellophane with a printed paper identification tag inside, and then the package (6)
was changed back to foil. The latest change was about five years ago (15-16).

Corn poppins, French fries and pretzels have been wrapped in cellophane bags (57). Potato chips are wrapped in transparent glassine bags (56, 70-71). They compete with potato chips in boxes or cellophane bags (71).

Changes in packaging are not made hastily by Curtiss because it is dangerous to tamper with a well established package. Any change must be approved by the Production Committee, Sales Committee and President. The important considerations are protection to the product, sales appeal and cost. The material must be also usable on automatic packaging machinery (16-17).

Curtiss consults in connection with its packaging problems Modern Packaging, Modern Packaging Encyclopedia,

Food Industries, Packaging Parade, and Confectioners' Journal (18, 19).

Technical assistance is important to Curtiss, which needs and welcomes it. Products and other things being equal, the firm that will provide the most technical assistance will get the business (19).

Curtiss has used more du Pont than Sylvania cellophane, considering both converted and unconverted, principally because it had difficulty many times in heatsealing Sylvania cellophane. With high speed machines, unsatisfactory heatsealing is disastrous, because when continuity of production is broken, costs increase. When film does not seal properly, (7)
the packaging machine is shut down, and the defective roll cleared from the machine. Then the roll is tried again half a dozen times, at different places in the roll. After trying that for 15 or 20 minutes, if still unsatisfactory, the roll is set aside and a different one put on the machine. At times Curtiss has bought substantial quantities of Sylvania film, but this was before the operational difficulties. Curtiss has since tried Sylvania cellophane at various times, and though it has improved, Curtiss continues to purchase principally the cellophane that has given best results, i.e., du Pont (19, 20, 33, 75, 76).

Curtiss has used Sylvania cellophane in both converted and unconverted form (39). Curtiss has had difficulty heatsealing Sylvania cellophane for 10 to 15 years, throughout Mr. Jakes' experience (39-40). This was true both of cellophane purchased direct from Sylvania and bags made of Sylvania film from converters. Curtiss experienced trouble in heatsealing Sylvania film within the last year or so (40-41). Mr. Jakes could not specifically state that in a particu-

lar year Curtiss bought Sylvania film and it gave trouble or did not, but knew of purchases of such film by Curtiss within the last five years (41). In the case of converted bags, it is possible that the defect in sealing is attributable to the converter, but Curtiss has found that cellophane purchased directly from Sylvania in roll form did not seal properly when put in bag making machines, or used in some way (8) which required heatsealing (41-42). Even in the case of bags purchased from converters, Curtiss itself heatseals the fill end (66). A number of experiments on Sylvania cellophane have convinced Curtiss that the difficulty of getting a proper heatseal has not yet been eliminated (77). Curtiss' experience is that there is something inherently wrong with Sylvania cellophane from the standpoint of heatsealing (42). Curtiss brought its difficulties with Sylvania film to Sylvania's attention and discussed the difficulty with Sylvania (45-46). Curtiss sought credits from Sylvania for the defective cellophane, but Mr. Jakes did not know whether they were allowed or not (45-46). Curtiss did not have trouble with all Sylvania cellophane, but there was a lack of continuity in its heatsealing properties (43). The slip and running quality of Sylvania cellophane were satisfactory (43, 77).

Curtiss has had trouble on occasion with du Pont cellophane, but it was much less in amount and seriousness than the trouble with Sylvania cellophane. Curtiss' operating experience is that du Pont cellophane is of better quality than Sylvania cellophane (43, 66).

Curtiss seeks to have more than one source of supply on any item that is competitively sold, and would have used Sylvania cellophane if it could have done so. Curtiss regards

du Pont, Sylvania and Olin as available sources of supply for cellophane being sold competitively in the sense of a similar (9)
product at a similar price. Olin's salesmen have called on Curtiss, and Curtiss has tried a small order of Olin film. The first shipment was slightly cloudy, but Curtiss is anxious to get more (46, 47).

Complete packaging costs are determined by Curtiss on every item it makes, and if the cellophane of one producer carried a premium price it would not be used. Mr. Jakes did not know the comparative prices of du Pont, Sylvania and Olin cellophane now or in the past (47, 66). He presumed on the basis of the packaging cost study that the du Pont and Sylvania prices were ordinarily the same. If Sylvania cellophane were priced lower than du Pont's and would work satisfactorily, Curtiss would buy it and use it (47).

Curtiss has not purchased foreign cellophane, as domestic cellophane has usually been available. Foreign cellophane is much higher in price than domestic film, and if domestic cellophane were not available, Curtiss would substitute some other material (20, 21).

Suppliers of packaging materials come to Curtiss with ideas for new packages. Du Pont's suggestions, based on market analyses, are read by members of the Curtiss production group, sales planning committee and sales executives. They have helped Curtiss. Sales executives have used ideas from du Pont market surveys (17-18, 21). One comprehensive market survey on methods of merchandising (10)
food products in which Curtiss was interested reported on consumer likes and dislikes in packaging. The survey

seemed to be quite complete (44). No similar services were received from Sylvania, and little from suppliers of glassine, wax paper, etc. (21-22).

Other suppliers are better on their technical service than they are on market analysis and other constructive reports, but du Pont's technical services are superior (22). Du Pont sales representatives and technical men have worked with Curtiss. In one case when Curtiss had a problem of breakage of cellophane in cold weather, it packaged cartons in ways suggested by du Pont and sent them to du Pont for testing. Du Pont tested the various packages in its research laboratory over a period of several weeks (44-45). This was not the only incident, but it was beyond the scope of the usual technical service where an engineer discusses a certain film or a certain problem (66, 67).

The quality of du Pont cellophane has gradually improved over the years, and is now more uniform in clarity and heatsealability, and more resistant to moisture. Improved types have been developed (22-23). Curtiss uses principally moistureproof heatsealing cellophane and does not use much non-moistureproof cellophane. A new type of du Pont cellophane, K-202, is interesting to Curtiss because of its resistance to breakage in extreme cold. K-202 stands up better than other types of cellophane packages, which shatter if dropped at 10°-15° below zero (22, 23). (11)

Curtiss packages principally by automatic and semi-automatic machinery. Many of its machines will handle various types of materials, including printed foil, glassine, cellophane, other films, and wax paper. On one machine a combination of cellophane and glassine is used and heat-

sealed. Du Pont has given Curtiss little assistance in Curtiss' machine developments. Curtiss' major packaging operations are entirely of its own development, and not on machines available in the open market (24, 25).

Curtiss purchases, or has purchased, cellophane from Milprint, Traver, Dobeckmun and other converters, and also direct from du Pont and Sylvania. Foil is purchased from Foil Products, Co., Reynolds Metals, and Aluminum Co. of America; pliofilm from Goodyear Tire & Rubber Co.; and waxed paper from several companies. Curtiss has purchased printed foil and glassine from the same converters from whom it buys cellophane. From Milprint alone, Curtiss has purchased cellophane, glassine, foil, pliofilm, wax paper, greaseproof paper and laminated gum wraps. The Milprint salesman sells all these materials and does not specialize in a single wrapping material (10, 11, 23-24, 29-31).

Curtiss buys cellophane principally in roll form, and would probably not consider using cellophane if it were available only in sheet form. The roll form is essential to machine operation (25).
(12)

A cellophane price increase would have a serious effect on Curtiss' purchases. Curtiss sells an end product at a fixed price and cannot charge more. An increase in the price of cellophane could be compensated for by a reduction in the size of the product which might take the product out of the market, or Curtiss could discontinue the use of cellophane and substitute printed glassine, wax paper or some other less costly wrap. If cellophane, glassine, and foil all raised prices the same amount at the same time, Curtiss would reduce the size of its products. A cellophane price increase would not cause abandonment of cellophane on

candy bars because Curtiss does not use cellophane on candy bars (25-27, 62).

In most instances in which Curtiss has used cellophane to package a product, cellophane was a substitute for some other wrap (27).

Cellophane's ability to stand up under the high speed (300 a minute) of a caramel wrapping machine and its moisture protective quality influence Curtiss to use cellophane to wrap caramels. The tendency of cellophane to stick to the caramel has been reduced by later improvements in the film (29).

Mr. Jakes without having the actual figures available, estimated that Curtiss' annual purchases of cellophane are not less than 200,000 lbs. (31-32, 34-35). Curtiss' actual consumption of cellophane was approximately 621,000 lbs. (13)
in 1949 and 689,000 lbs. in 1950 (81). The larger portion of this poundage is purchased from converters and the balance directly from producers. Curtiss has purchased cellophane from Milprint since before 1931 (32). Mr. Jakes did not know when Curtiss began buying cellophane directly from manufacturers (32-33). He was not familiar with Catty's activities as a wholesaler of unconverted cellophane, and did not recall any purchases of cellophane by Curtiss from Catty, though Curtiss buys foil from Catty (33). Mr. Jakes has not come directly in contact with buying, which is done by the Purchasing Department, and he had no direct knowledge of the purchase or sales arrangement between Curtiss and du Pont for the past ten years, or when Curtiss began buying directly from du Pont (33-34, 65). He did not know whether Curtiss ever received quantity discounts from du Pont (39).

At times Curtiss has not been able to get all the cellophane it wanted from any producer, including du Pont. Its current allocation may be 15,000 pounds a month for purchases direct from du Pont, but Mr. Jakes was not sure of this (34, 35, 38).

If cellophane had been freely available in 1949 and 1950, Curtiss' consumption could possibly have been increased by 10% (81). From year to year Curtiss' volume of cellophane used varies depending upon the type of product and the packaging. It now has one line of products in printed cellophane that it did not have five years ago, and the use (14)
of cellophane has gone up as the sales of that line of products went up (35).

Curtiss does no printing of cellophane, but has been making some of its cellophane bags for the past ten or twelve years. It decided to do so because operations would be more flexible and quick changes could be made in the size or shape of the bag without depending upon a converter. Expected cost saving was another factor (36, 37).

Converters allocate cellophane to their customers on the basis of past purchases or some other equitable basis. Curtiss at times has not been able to get all the converted cellophane it wanted. Mr. Jakes understood that converters have been limited in the quantities of cellophane they can obtain, and have allocated to their customers so as to treat customers fairly within the limits of the cellophane the converters could obtain (38-38A). Mr. Jakes had no knowledge of whether du Pont took into consideration the cellophane Curtiss received from converters in setting Curtiss' allocation for cellophane purchased directly (38A).

On heatsealing packaging machines, adjustments must be made when shifting from one material to another, or

from one type of cellophane to another. Adjustments from cellophane to some other wrap would probably require more time and effort than from one type of cellophane to another type (76, 79). It is an advantage from a production standpoint to keep running the same type, without intermingling. Wax paper could not be run on a machine immediately after (15)
cellophane without thoroughly cleaning the machine and adjusting it. When any heatsealing material is run through machines, whether cellophane, waxed paper or glassine, the heatscaling elements have to be cleaned after each run (76, 79, 80).

Not all Curtiss products packaged in transparent wraps are packaged in the same material (56-57). Nuts are in pliofilm, corn poppins. French fries and pretzels in cellophane, and potato chips in semi-transparent glassine. These products are enhanced, from a merchandising point of view, by transparency, and sell more readily when the purchaser can see clearly what is inside the bag. Curtiss potato chips in glassine bags are visible to the consumer (56, 57, 58, 80).

Curtiss considers the nature of each product before determining the material it will use to wrap the product. For each product there is an ideal wrapper. Curtiss seeks to put each of its products in what it considers at the time the ideal wrap for that product. Protection, cost, visibility, if necessary, and other factors have to be recognized in arriving at an ideal wrap. No one factor makes it ideal. An ideal wrapper is one that combines all the qualities you would like to have, including cost factors. The ideal wrap is a combination of protection, cost and sales appeal (58, 69-74). At the time of changing candy bars to cellophane,

Curtiss thought cellophane was the ideal wrap, but its views later changed. As to products other than candy bars, also, (16)

Curtiss' ideas as to the ideal wrap have changed in the light of the technological developments. Curtiss believes glassine is the ideal wrap for potato chips (70).

As a matter of policy, Curtiss does not generally package the same product simultaneously in two different materials. To that extent no two wrappers are interchangeable concurrently except in case of emergency (60). The basis of the policy against simultaneous packaging of a product in two materials is a belief it would be confusing to customers and probably not helpful to Curtiss, since it would not be building acceptance of either wrap (74).

When Curtiss selected cellophane as a wrap for a product, it did so because it felt cellophane properly displayed the product to the customer and probably provided the required protection (60). Cellophane has greater display value for certain products than the non-transparent or semi-transparent wrappers (60-61). In addition to its (17)

transparency, cellophane's qualities that aid its effectiveness in merchandising are protection, which is important to a perishable food product, and brilliancy by reflection of highlights. This ability to reflect light is sometimes described as eye appeal (61). Wax paper does not have the same eye appeal as cellophane. Glassine is not quite as brilliant as cellophane. Curtiss does not use cellophane on all its packages where eye appeal would be desirable because the cost would be prohibitive. Foil has eye appeal. The eye appeal of waxed paper and of glassine has improved (61, 74, 78, 79).

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Cost is a factor in the non-use of cellophane by Curtiss on candy bars (62-63). Cost is always a factor, including Curtiss products that are wrapped in cellophane. It is not true that Curtiss products wrapped in cellophane are higher profit items (63).

Mr. Jakes was not familiar with a group of wrappers which by their nature can be designated as fibrous (63). He was familiar with wax paper, glassine, sulphite paper, parchment paper, and on the other hand with cellophane, pliofilm, polyethylene, and acetate, but makes no generic distinction between these two groups (63-64). He had never heard of packaging materials being put into two classes designated as fibrous and non-fibrous. Curtiss does not select a material for packaging because it is fibrous or be-
(18)
cause it is non-fibrous; whether it is one or the other is never mentioned in meetings where discussion is had of materials to be used (74, 75).

Unconverted and unprinted materials primarily of a paper base cost the packager less than cellophane. Acetate, pliofilm and polyethylene cost more. Du Pont's K-20? film sells at a premium price, and from Curtiss' viewpoint its qualities make it worth more. This type has been available only since 1950 (64, 65, 67).

Wax paper has improved as a packaging medium in the last twenty years. The quality of printing on wax paper has been quite improved, and there has been a decided improvement in opacity as a background for printing (68). Glassine in the last fifteen or twenty years has improved in tensile strength, opacity, finish, and ability to take printing (68). There have been commensurate improvements in cel-

lophane wraps (78). The improvements in wax paper and glassine have affected their acceptability to Curtiss as packaging mediums, and caused Curtiss to continue using them (69). At the present time, cellophane is much more transparent than waxed paper, and more than glassine (78). Wax papers, glassines, and cellophane are all available to Curtiss in many different types, generally tailored to particular products (69, 78).

A letter from the Department of Justice to Curtiss dated August 2, 1951, inquiring as to Curtiss use of cellophane (19)

and other flexible wrapping materials, and two letters from Curtiss to the Department of Justice, dated August 15, 1951 and October 14, 1951, respectively, were identified. They were marked for identification respectively as Plaintiff's (Jakes) Exhibit 1, Plaintiff's (Jakes) Exhibit 2, and Plaintiff's (Jakes) Exhibit 3, and offered by plaintiff without objection by defendant (54, 55, 79, 80).

D.X. 1007

(1)

NARRATIVE SUMMARY OF DEPOSITION OF DAVID S. HOPPING

Taken January 22, 1952 at New York, N. Y.

David S. Hopping, who resides in Greenwich, Connecticut, appeared by subpoena (2, 23). He is Director of Sales, Transparent Film Department, Plastics Division of Celanese Corporation of America (2). Celanese makes cellulose acetate* packaging films (2), and has made them since 1931 (5). They now account for less than 10% of the total business of Celanese (3), which includes a varied line of yarns, chemicals, plastics, films (2) and sheeting (26). These packaging films are sold by the trade name of "Lumarith" or "Celanese Acetate" (11). Of a total national production of CA packaging films of about 12,000,000 pounds for 1950, and approximately 16,000,000 pounds estimated for 1951, Celanese is by far the largest producer, at least as large as the other two producers (Eastman and du Pont) combined (3). Imported CA packaging films are an insignificant factor in the domestic market because of poor quality and high price (3).

Celanese's volume of sales of CA packaging films has increased at the following rates: 1936-1940, 470%; 1940-45, 99%; 1945-50, 122%; 1950-52, estimated 165% increase (14). Much of this expansion has been attributable to the development of self-service supermarkets (22, 28), and diversification of types of film (22).

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*Referred to hereinafter as CA.

(2)

Two principal gauges of CA packaging films are made by Celanese, .001" and .00088", in the order of importance of sales. Of the first gauge, 100P-904 and 100S-600 are the major sellers (4). Celanese sells a large variety of types within the .001 and .00088 gauges, each type specially developed for certain applications or uses (5). Celanese makes a heat-sealing CA film, selling at the same price as the regular film (27).

Mr. Hopping believed CA is a product distinct from cellophane. About one-sixth of CA produced by Celanese is sheet, rather than film, i.e., .003" and over. No figures for production or prices given by Hopping include sheet. Eastman Kodak produces principally sheet and heavy gauges of film. Celanese produces no CA butyrate, but Eastman does (24-26).

About 70% of all CA films made by Celanese are sold for packaging uses. About 40% are sold for food packaging alone (5-6). The following broad headings of applications account for the percentage of Celanese CA film sales shown:

Wrapping and Bags	— 28 %	
Laminations	— 28 %	
Window packages	— 22 %	
Tapes	— 13.5%	
Insulation	— 6.5%	
Miscellaneous	— 2.0%	(6)

About 70% of the film sold for packaging uses and about 50% of the total is sold through converters, the remainder directly to users. All packaging uses are served by both direct and indirect sales (6-7).

(3)

More specific packaging applications for which Celanese sells its CA films and which it intensively promotes are: fresh produce bags, bacon wraps, tomato cartons or "boat" wraps and windows (8, 28). Wrapping of stationery is also a major use (8). CA film is used in small quantities for packaging fresh meat, pies, rolls, iced cakes and doughnuts (as both a wrap and carton window) (8-9). Celanese does not recommend its CA film for fresh meat, as its moisture-permeability permits dehydration and darkening of red meat more readily than cellophane or Pliofilm (8, 29). This property is an advantage in the wrapping of iced cakes and doughnuts, but not plain or sugared doughnuts (40). Moisture permeability has prevented widespread use of CA films in the baking industry at large and for cereals (8, 9, 29).

Generally speaking, cellophane is used in nearly all packaging applications for which Celanese promotes and sells CA film, and in most of its applications CA film depends for its sales upon a partial displacement of cellophane, the two materials being used concurrently in most such applications, except for a few industrial uses of CA (12, 17).

Means of promotion employed by Celanese are: advertising, direct mail, publicity, direct solicitation (7). Publications in which Celanese promotes and advertises its CA film are:

Modern Packaging
Pre-Pack-Age
Packaging Parade
Boxboard Containers
Meat

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National Provisioner

(4)

Meat Merchandising
Chain Store Age
Supermarket Merchandising
Food Topics
Progressive Grocer
Business Week
Modern Industry (20)

Mr. Hopping knew of no packaging use for CA film of which cellophane does not have a part of the market (38). Celanese has "always aimed at cellophane" in its marketing and in its pricing, and CA's "major competition is cellophane" (12, 13). The degree of displacement of CA by cellophane, and vice-versa, varies from one part of the country to another, CA being dominant for packaging fresh produce in the West, and cellophane in the East (34-35).

In many of these applications CA also competes with Pliofilm, for example, for bacon wraps, produce bags, fruit bags. CA and glassine compete as bags for small pies and bacon wraps, as well as in grease-proof and water-proof wrapping in laminated form. To a lesser degree this kind of competition is true between CA and aluminum foil and CA and polyethylene film (13). CA is preferred to papers or foil where a transparent wrap is desired (36). CA competes almost entirely with moistureproof cellophane, as opposed to non-moistureproof, but not where the film is used as a moisture barrier. The coating on moistureproof cellophane improves its dimensional stability, durability and appearance, as well as making it moistureproof (31). There are certain uses where CA and cellophane overlap con-

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(5)
siderably, and some where one is superior to the other, such as cellophane superiority where a moisture barrier is required (30, 31). Celanese claims "eye appeal" or "sales appeal" of CA film to be superior to cellophane and Mr. Hopping believed this superiority is recognized by the trade, as proven by the fact that Celanese can get a higher price for CA than for cellophane (21, 32). CA's eye appeal is complete clarity, luster, and the ability to improve the appearance of ordinary or reverse printing on it (32).

Celanese claims eye appeal for CA superior to that of foil (36).

Converters to whom Celanese sells CA packaging films include:

Shellmar Products Co.
Dobeckmun
Milprint
Crystal Transparent
Printon
Waxide
Package Products
Forbes Lithograph Co.
Nashua Gummed & Coated Paper Co. (23).

CA film has consistently been at a price disadvantage to cellophane (14). The price of P-904 and S-600 types of CA does not differ between the .001 and .00088 gauges, and has been:

1934	— $.68 a pound
1937	— $.63
1939	— $.60

21

1946 — $.67
Jan. 1948 — $.73
Sept. 1948 — $.77
Oct. 1950 — $.82
Jan. 1952 — $.75 (S-600 only) (15-16).

(6)

Celanese promotes its CA films for their principal advantages: Clarity, luster, crisp feel, sales appeal, dimensional stability, resistance to brittleness or deterioration, permeability to gases (*e.g.*, oxygen and carbon dioxide) (9-11, 17, 18, 19, 21, 30, 32, 34, 35). This last quality is important in preventing spoilage of packaged fresh produce, and also for pies (10-11, 40).

Disadvantages of CA film are a lack of moistureproofness, lack of toughness, a certain amount of electro-static which hinders machine handling, and relatively high price (9, 11-12, 14, 35). Great improvements have been made in machine handling techniques such as the introduction of static eliminators (38). Within the last fifteen years, and particularly within the last eighteen months, the toughness of CA film has been considerably improved (38).

Currently an effort is being made to reduce the spread in price between cellophane and CA film, in order to diminish the competitive disadvantage of CA's relatively high price, and to stimulate sales of CA film (16, 17, 30). Recently the price of cellophane went up, and the price of CA down, reducing the price gap (16). CA is superior to cellophane in dimensional stability, gas permeability (18), clarity and luster (19, 32); and eye appeal (21, 32), while cellophane is superior to CA in moistureproofness and facility of

handling on high speed machines (18-19, 28). In this last respect cellophane more closely approaches the papers (19). (7)

Except in respect to moistureproofness, PT cellophane has about the same advantages and disadvantages relative to CA as moistureproof cellophane does (20), though Mr. Hopping characterized competition between PT cellophane and CA as minor (31), hardly 5% of the volume of competition between CA and moistureproof cellophane (39).

Mr. Hopping believed that cellophane is non-fibrous (34), but is a transparent paper, rather than a plastic film, since it is regenerated cellulose rather than a true plastic. He thought the Society of Plastics Industry had classified it as a plastic (33).

Whether a wrapping material is fibrous or non-fibrous is not a material consideration in the trade. Mr. Hopping did not believe anyone in the packaging trade even thought about the quality of fibrousness or non-fibrousness of a material (22).

D.X. 1008

(1)

NARRATIVE SUMMARY OF DEPOSITION OF CHARLES A. SOUTHWICK, JR.

Taken January 21, 1952 at New York, N. Y.

Charles A. Southwick, Jr., who resides at Hope, New Jersey, is a consulting engineer to firms in the packaging industry (2). He is Technical Editor of *Modern Packaging* magazine and is chairman of the Panel on Packing Packaging and Preservation of the Committee on Equipment and Materials of the U. S. Department of Defense (2). In this last function he receives no compensation except travel expenses, and is not a Government employee (3). Mr. Southwick was formerly Director of Research for Shellmar Products Company and served as a technical engineer and later as director of the package development program of General Foods Corporation from 1930 to 1943 (3, 19, 20). He received a B. S. degree in 1928 from the Massachusetts Institute of Technology in chemical engineering (3-4).

At General Foods, at Shellmar and in his present work, Mr. Southwick has repeatedly made and supervised laboratory tests on properties of flexible packaging materials (4-5). In connection with his *Modern Packaging* employment he participates in such tests, publishes the

(2)

results thereof and has written and edited articles on testing procedures (5). He is familiar with testing procedures and results for all kinds of flexible packaging materials, and has cooperated with the Packaging Institute and the Technical Association of The Pulp and Paper Industry in developing

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such procedures (4-5). Uniformity of standards have been developed for rating the results of such tests (5-6).

Mr. Southwick is recognized by the packaging industry as an expert on the physical and chemical properties of flexible packaging materials (6).

Mr. Southwick supervised the preparation of a chart stating the physical and chemical properties of flexible packaging materials, which is on file with the court as Table 3 of Defendant's Offer of Proof No. 1. The sources of the information appearing on the chart were: charts of properties appearing in the *Modern Packaging Encyclopedia;* Mr. Southwick's personal knowledge and experience; assistance of the Film Department of the du Pont Company as to the entries on the chart for cellophane (7, 10-11). This document, after being identified by Mr. Southwick, was marked Southwick Exhibit 1 (6, 7, 11).

Mr. Southwick believed that Southwick Exhibit No. 1 is a fair, reasonable and simple non-technical statement of (3)
the content of the detailed information appearing on charts in the *Packaging Encyclopedia* (9, 24-25, 63), which the Exhibit converts to descriptive statements (7, 24). The factors for which ratings are shown are recognized by the packaging industry as the important factors (8). The *Encyclopedia* charts are contributed to by private and public research and are recognized by the trade as accurate (9, 10, 61). The information is periodically accumulated and regularly checked for accuracy and the charts have become a working tool relied upon by packaging engineers (9, 10, 61). Mr. Southwick believed the ratings shown by Southwick Exhibit No. 1 to be true and correct and agreed with and took responsibility for the content of the exhibit (8-9).

~~D.X. 1008~~

Mr. Southwick assisted in the preparation of brief definitions of each of a number of flexible packaging materials, which were marked Southwick Exhibit 2 (11-12). These definitions are identical to those appearing as numbered Paragraphs 1 through 11, beginning at page 9 of Defendant's Offer of Proof No. 1. The definitions are not detailed, and are not complete enough to disclose a means of manufacture of any of these materials, nor are they intended to be so detailed (12, 40). Mr. Southwick believed them to be (4)
good brief descriptions of the materials, corroborated by his own experience and knowledge of the materials (11, 12, 40).

For his time spent in assisting in the preparation of these exhibits for the Defendant, Mr. Southwick billed his time to defendant's counsel, Covington & Burling (22), in accordance with his usual practice (66).

Modern Packaging is a monthly magazine published since 1927, with the largest circulation and acceptance of any publication in the packaging industry (13, 16, 17). The technical section and a section called "*Equipment and Materials*" are widely used (13, 14). The technical content of *Modern Packaging* stimulates a flow of inquiries through the Reader's Service of the magazine, and, together with the *Modern Packaging Encyclopedia*, produces some 20,000 inquiries a year (14, 15). Mr. Southwick handles the more difficult of these inquiries (15). The *Modern Packaging Encyclopedia*, formerly the *Packaging Catalog* (17) is used by the packaging industry as an impartial technical reference book (13). Mr. Southwick knew of no other source of as much specific technical information on packaging materials as the *Encyclopedia* (61-62).

27.

Both the *Modern Packaging Encyclopedia* and *Modern Packaging* magazine are published by the Breskin Publish-
(5)
ing Corporation, by separate staffs within the Company up to 1952 (16). Beginning in 1952, the *Encyclopedia* was reduced in size and detail so as essentially to change the entire character of the publication and was given out with an issue of the magazine (16-17).

Around 1948 the *Encyclopedia* was divided into sections: paper and paper products, foil and foil products, plastic films, collapsible tubes, glass containers, etc. (23, 26-27). This was necessitated by the inconvenience of handling increasingly voluminous and complex material in the *Encyclopedia,* and was not intended to have any bearing on use of the packaging materials (23, 26-27, 62). This led to having separate charts for physical properties of packaging materials, one chart for each of these sections, since a single chart became unwieldy and inconvenient to present (23, 26).

The trade in which these publications are circulated and used includes: converters, users of packaging materials, suppliers of packaging materials, and package machinery manufacturers (18-19).

In 1951 an article written by Mr. Southwick in the *Modern Packaging Encyclopedia* on plastic films included mention of a new source of supply for cellophane and fore-
(6)
cast an expanded future demand for cellophane (29-30). The article said plastic materials have invaded almost every field imaginable; that their growth was marked in the number and types of films and the increased packaging applications (30). This article included a discussion of cellophane

(33) even though cellophane is not strictly speaking a plastic film (32-33, 37, 46) and discusses materials of extreme differences in composition and properties (31) such as cellulose acetate (33-37, 50) and rubber hydrochloride (38-39). The many plastic materials cannot be classified by end use, since they cover a range of uses from completely decorative to industrial uses where appearance is not a factor (32-33). Mr. Southwick wrote in another article in Vol. 7 of *Colloid Chemistry* that cellophane is the most popular plastic and transparent film, and "continues to dominate the field and is finding expanding uses as carton overwraps or as bag material, both printed and unprinted" (49).

Cellophane and cellulose acetate differ in that the latter is thermoplastic (35-37, 42) and is not highly absorptive of moisture as is cellophane (35, 43), thus having superior shrink-resistance and dimensional stability. (33, 46, 50). (7)

Moreover cellulose acetate permits transmission of moisture (34, 50). It has widespread use for printed bags and envelopes where moistureproofness is not required, and as laminated film over printed paper or foil for many uses (50).

In the 1951 *Modern Packaging Encyclopedia* Mr. Southwick wrote of rubber hydrochloride film that its base is rubber, not cellulose, that it can be printed and laminated, that it is inherently moistureproof, that its higher price is frequently equalized by the use of light gauges, and that in general there is little competition between it and other plastic films described in the article because of extreme differences in properties and end uses (38-39).

Mr. Southwick wrote in 1950 in Vol. 7 of *Colloid Chemistry* that packaging of fresh produce was more for

display than for protection and was largely done near the point of sale (50). Protection is an important consideration in produce packaging, but less so than other factors when the packaging is done near the point of sale. Since 1950 progress has been made toward packaging fresh produce near the point of production, which will make protection requirements a more important factor (50-51).
(8)

Polyethylene film is not particularly easily handled on packaging machines, although since its introduction machines have been developed and modified to handle it and other plastic films with no difficulty. Machines to heat-seal polyethylene bags were rapidly developed. This development work has solved the problem posed by the narrow temperature range in which polyethylene can be heat-sealed. Experience gained in running polyethylene through presses and packaging machines has helped to eliminate the problems. Polyethylene is now printed by any up-to-date converter. Today Traver, Dobeckmun, Shellmar and many others are printing polyethylene well (51-55). This is general bag printing, and the like, and not process printing, which is not required by the trade (55).

Aluminum foil of .00035" gauge has been used without lamination as a chocolate bar wrap, absent Government restrictions on its use, though it is laminated in other uses. Foil in thin gauges tends to have pin holes and low strength though it is useful and used where these factors are not of critical importance (40-42).

Whether a material is fibrous, like paper, or non-fibrous, like films and foil, is not a particularly important differen-
(9)
tiation though the films have low tear-resistance (46-47).

For any end use there is a variety of choice of flexible packaging materials, or combinations, that will satisfy the requirements. This is so because only rarely does an end use require the full degree of a property which a material possesses. Usually a lesser degree of that property is required, and a combination of properties is needed. A number of materials can provide the combination of properties and the necessary degree of each and thus a packaging problem can be solved many different ways (44-45, 63-65).

Mr. Southwick could think of no definable area of use that would require exactly the properties of cellophane and could not be solved by any other material (65-66).

Mr. Southwick was not familiar with the situation of supplies of flexible packaging materials, nor with present or projected Government restrictions, his Government consultation experience being limited to research and development matters (56-57).

Mr. Southwick has not been concerned or familiar with the merchandising aspects of "eye appeal" of wrapping (10)
materials, as opposed to the engineering aspects, though he wrote in Vol. 7 of *Colloid Chemistry,* 1950 that the package has become important as a sales aid by means of attractiveness, advertising, maintenance of brand identity, and convenience in distribution and delivery of the packaged product (47-48, 67).

Generally speaking, Mr. Southwick had no experience or qualifications in merchandising aspects of packaging, and consequently has always approached flexible packaging materials from an engineer's point of view (67, 68-69, 71). In reporting as an engineer the number of materials that

will do a packaging job. Mr. Southwick does not consider factors of merchandising appeal, but does operate within certain stated limitations which are fixed by the sales manager or other executive of his client or employer. Such stipulations may be transparency, ease of opening, length of required shelf life or other requirements, stipulated for reasons which are none of Mr. Southwick's concern (67-70). Mr. Southwick attempts to give the maximum number of solutions to a packaging problem (69). Each packaging material, however, has certain physical and chemical properties that tend to emphasize certain types of uses as the area of its particular usefulness (34, 43-44).
(11)

The clients of a packaging engineer require a report on engineering feasibility of materials, package forms, machinery, etc. The packaging engineer does not select the material to be used, this being done by the client or employer within the areas reported as feasible (72-76).

General Foods, Mr. Southwick recalled, used a substantial amount of cellophane, generally for merchandising considerations, though Mr. Southwick's practice was to suggest a variety of materials to package a product. Company executives made a selection within this area (71-72). Some products could not be packaged in a certain class of materials having a common characteristic (72-73). In the case of Grape Nuts, Mr. Southwick specifically advised against the use of any vapor-resistant material such as glassine, cellophane, parchment and some plastic films (72-74), and the Grape Nuts carton is now wrapped in printed waxed paper (74).

Both Shellmar and General Foods used cellophane from both Sylvania and du Pont (57). Mr. Southwick recalled

that of the cellophane used on frozen food packages by General Foods, nearly all was du Pont film, there having been quite close technical assistance from du Pont on this from an early date (59). General Foods liked du Pont's quality and du Pont's technical assistance in solving problems (59). (12)

There is no basic difference between Sylvania and du Pont cellophane. When a press is set up for a given job and a film runs on it, the user tends to use that film through twenty other suppliers may have a material that will work as well (60). Mr. Southwick's work at General Foods and Shellmar was technical, concerned with the fundamental packaging characteristics of materials, rather than actual purchasing of them or some of their operating characteristics in a plant (60). From his laboratory side of the business, he probably could not tell the difference between du Pont and Sylvania cellophane (61).

Defendant's Southwick Exhibit 1

D.X. 1008-A

Table 3, Offer No. 1

PHYSICAL PROPERTIES

Packaging Material	Heat Sealability	Printability	Clarity	Tear Strength (Elmendorf)	Bursting Strength	Water Absorption in 24 Hrs. Immersion	Moisture Permeability	Permeability to Gases (2)	Dimens. Change With Humid. Diff.	Resistance to Greases & Oils	Wrapping Machine Running Qualities
Cello. (plain)	Yes (if coated)	Yes	Highly Transparent	Low	High	High	High	Very Low	Large	Excellent	O. K.
Cello. (Moistureproof)	Yes (if coated)	Yes	Highly Transparent	Low	High	High	Low-Medium	Very Low	Large	Excellent	O. K.
Plain greaseproof paper	No	Yes	Opaque	Good	Low	High	High	Medium	Moderate	Good	O. K.
Plain Glassine	No	Yes	Commercially Transparent to Opaque	Good	Low	High	High	Low	Moderate	Good	O. K.
Lacquered Glassine	Yes	Yes	Commercially Transparent to Translucent	Good	Low	Low	Low-Medium	Low	Moderate	Good	O. K.
Waxed Glassine	Yes	(1)	Commercially Transparent to Translucent	Good	Low	Low	Low	Low	Moderate	Good	O. K.
Vegetable Parchment	No	Yes	Tends to be Opaque	Good	Good	High	High	Low	Moderate	Good	O. K.
Waxed Paper (18 lbs. or over)	Yes	(1)	Commercially Transparent to Opaque	High	Good	Low	Low-Medium	High	Moderate	None	O. K.
Aluminum Foil	No	Yes	Opaque	Low	Low	Nil	Very Low	Very Low	None	Excellent	O. K.
Aluminum Foil (Heat Sealing)	Yes	Yes	Opaque	Low	Low	Nil	Nearly Nil	Very Low	None	Excellent	O. K.
Cellulose Acetate	Yes	Yes	Highly Transparent	Low	High	Low	High	Variable	Very Small	Excellent	O. K.
Pliofilm (rubber hydrochloride)	Yes(3)	Yes(3)	Highly Transparent with Slight Haze	Medium	High	Low	Medium	Low	Very Small	Excellent	Good(3)
Saran (Vinylidene chloride)	Yes(3)	Yes(3)	Highly Transparent	High	High	Low	Very Low	Very Low	None	Excellent	Poor(3)
Polyethylene	Yes(3)	Yes(3)	Transparent with Slight Haze	High	High	Low	Medium	High	None	(4)	Poor(3)
CryORap	Yes(3)	Yes(3)	Transparent with Slight Haze	High	High	Low	Medium	Low	None	Excellent	Poor(3)
Sulphite (high finish wrapper and label paper)	No	Yes	Opaque	High	Medium	High	Very High	High	Moderate	None	O. K.

References: (1) Normally printed before waxing.

(2) The permeability to gases can vary greatly depending upon the gas and the humidity conditions. The levels indicated in this chart apply particularly to flavor type volatiles as found in many food products.

(3) Plastic films may require special heat sealing techniques, and printing processes or special machines.

(4) Not affected by greases but penetrated by some oils.

(5) The information on this chart is based upon the generally accepted properties of the materials listed; however, materials produced by different processes, formulations, coatings, raw materials, surface treatments, and thicknesses can show considerable variation from the properties indicated.

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D.X. 1008-B

Defendant's Southwick Exhibit 2

BRIEF DESCRIPTIONS OF FLEXIBLE PACKAGING MATERIALS

1. Aluminum foil is a thin aluminum sheet. The gauges commonly used for packaging are from .0015 to .00035 inches. The foil is used by itself as a packaging medium. It is also laminated to glassine, paper or tissue, to other films, or to cellophane. It is opaque, brilliant of surface, highly moistureproof, and readily takes a semi-permanent set, known as "dead folding". It can be printed easily, and like cellophane can be sealed by heat when coated.

2. Cellulose acetate is a film usually made by the flowing of a solvent solution of cellulose acetate (a chemical compound of wood-pulp, cotton linters, and acetic acid) onto a large diameter, slow moving casting wheel, or metal belt. The solvent evaporates, and the dry film is stripped from the wheel or belt as it turns. The film can also be made by an extrusion process. It is transparent and dimensionally stable (will not shrink or pucker with humidity changes). It is waterproof, but has high permeability to moisture. It can be printed easily, and sealed by heat, if coated. It has a high surface gloss.

3. Cry-O-Rap is the trade name of a film made from a modified polyvinylidene chloride resin. Its chief characteristics are chemical inertness, transparency, durability, and flexibility at low temperatures. It can be shrunk around irregularly shaped objects by application of moderate heat.

(2)

4. Greaseproof paper is made by beating wood-pulp in a vat filled with water until the fibers become saturated and gelatinous in texture. The resulting product is translucent and highly resistent to oil and grease.

5. Glassine is produced by finishing greaseproof paper between highly polished metal rollers (super calendars) under heat and at great pressure. This process develops the considerable transparency and surface gloss which are characteristic of glassine. It is inherently greaseproof, and can be sealed by heat, if coated. It is frequently made moistureproof by coating with appropriate lacquers or waxes and may be printed readily. Glassine and waxed paper are the two materials which have been sold in the largest quantities in direct competition with cellophane for the longest period of time.

6. Pliofilm is the trade name of a film produced by the flowing of a solvent solution of rubber hydrochloride onto a moving web. The web passes through a heated chamber, which evaporates the solvent and leaves a clear, transparent film. Pliofilm is extremely tough, can be stretched to 5 or 6 times its original dimensions, is inherently moistureproof, and is capable of weld-type heat sealing. Heavier gauges are slightly cloudy. It can be shrunk tightly around an object by application of moderate heat, and can be printed.

(3)

7. Polyethylene film is made from a solution formed from high-pressure polymerization of ethylene gas. This

solution can be cast, calendered or extruded to produce the film. Principal characteristics of the film are chemical inertness, flexibility even at low temperatures, and good inherent moistureproofness. Polyethylene film is fairly transparent, but slightly hazy.

8. Saran is the trade name of a film made from polyvinylidene chloride. It is characterized by strength, toughness, flexibility, extreme transparency, and chemical inertness. It has the highest moistureproofness of all the packaging materials under discussion.

9. Sulphite Paper is high grade, machine-finished or machine-glazed paper used largely as wrapping or bag paper, for the packaging of food and other merchandise. It is the usual basis of wrappers (e.g., paper component of cigarette pack), waxing stock (for waxed paper) and other uses where moderate strength, flexibility and good coating and printing surface is required.

10. Vegetable Parchment is made by passing unsized raw paper (waterleaf) through a sulphuric acid bath, and drying on regular paper machine dryers. This "parchmentizing" covers the paper with a thin layer of gelatinouscellulose which fills the interstices of the fibres and cements them into a cohesive mass. Vegetable parchment is highly greaseproof,

(4)

has great wet strength, and is slightly translucent.

11. Waxed Paper (Over 18 lbs. base stock*) is made by applying melted wax to sulphite or sulphate paper. In some cases the wax is pressed into the paper between rollers. Waxed paper is made in various degrees of transparency, and is inherently sealable by heat. Resins and other materials are frequently added to the wax to enhance surface gloss, heat-sealing properties and low-temperature flexibility. In the printed forms, print is usually applied prior to waxing.

*Over 18 lbs. to a ream of 480 sheets of 24 x 36 inches.

D.X. 1009

(1)

NARRATIVE SUMMARY OF DEPOSITION OF T. A. TORRENCE

Taken February 11, 1952 at Pittsburgh, Pa.

T. A. Torrence is Product Manager for Aluminum Foil for the Aluminum Company of America (Alcoa). His office is in Pittsburgh and his home in New Kensington, Pennsylvania. He testified pursuant to subpoena (2).

Mr. Torrence has been connected with the production and sale of aluminum foil for approximately thirty years (2). Alcoa's first commercial sale of aluminum foil was in 1914 (2).

Mr. Torrence identified "Defendant's Torrence Exhibit No. 1" as a photostat of an inquiry received by Alcoa from the Department of Justice as to foil and its uses, dated August 2, 1951, and identified "Defendant's Torrence Exhibit No. 2" as a correct statement of Alcoa's answers made August 31, 1951 to the inquiry. He believed that the answers contained therein were correct (3-4).

Aluminum foil is produced in the United States by Alcoa, Reynolds Metals, Johnson Aluminum & Metal Co., Cochrane Foil Co., Republic Foil Co., Stranahan Foil Co., Kaiser Chemical & Aluminum Co., Aluminum Foils Co., and Standard Rolling Mills.

Aluminum foil sales amounted to 2.9% of total Alcoa aluminum sales in 1949, to 3.6% in 1950, and to a percentage in the same order of magnitude in 1951 (4).

(2)

Although Alcoa has no records which give percentages of foil that go to particular end uses, from Mr. Torrence's experience over 50% is used for packaging (4-5). Foil has

been subject to restrictions for use as packaging during some periods, but apart from those periods the trend of sales as a packaging medium has been increasing (5).

Broadly speaking the heaviest uses of aluminum foil are for packaging food, cigarettes and tobacco, and for manufacture of electric condensers (5-6). From 6% to 7% of Alcoa's foil goes to the condenser use (18).

Foil competes with glassine for some end uses, particularly chocolate bars now in glassine that in many instances were formerly wrapped in foil. Foil competes with cellophane, cellulose acetate, pliofilm and vegetable parchment. Foil and vegetable parchment are both used for packaging oleo margarine (7). Foil meets competition from Saran film, but not as acutely as from some of the other packaging materials (7). There is some competition with polyethylene although this is rather new (8). Foil competes with sulphite paper in the sense that in some situations a product is wrapped in sulphite and Alcoa is able to sell foil in place of it. In the same sense foil competes with waxed paper (8).

Foil is opaque, can be made heatsealing, can be printed, gives moisture protection, has excellent dimensional stability, and can be used commercially on high speed packaging (3)
machines (6-7). The principal points made when attempting to sell foil for packaging a product are opacity, moisture vapor resistance, dead folding properties and attractive appearance (8). Packages wrapped in foil appeal to the eye and sometimes impel a housewife to buy a product that she had not planned in advance to buy (8-9).

Alcoa advertises its foil principally in trade magazines, but also has some consumer advertisements. A number of salesmen are employed who call on both direct users and con-

verters. Limited use of market surveys is made in selling. Both users and converters are given technical service. However, there is no real identified service of merchandising ideas, such as ideas for new packaging or promotion schemes for a product (9-10).

In most cases, the direct users to whom Alcoa sells foil are also buying some other flexible wrapping material, and in many cases they are buying cellophane (10). Mr. Torrence knew of no converters who converted only foil, for in every case they always convert some other flexible material as well. Among the converters to whom Alcoa sells currently or has sold are Dobeckmun, Shellmar, Milprint, Marathon, Riegel Paper, H. D. Catty, Daniels and Kalamazoo Vegetable Parchment (11).

The 20 end uses of foil listed in Defendent's Torrence Exhibit No. 2 cover all important uses (19). Foil is used (4)
as a package for cream cheese, natural cheese in wedges, Blue cheese, Camembert, and others of that nature (11, 12, 16). It is used as a bag for potato chips (12). At one time, one or more of the foil producers attempted to sell a cigarette package that was completely foil without paper or cellophane. The attempt was not successful although substantial quantities of cigarettes were packaged that way experimentally (11-12). Aluminum foil itself displaced a composition foil of lead and tin for use in cigarette packages, starting in the late twenties or early thirties (12-13). Foil is used as a packaging medium for frozen foods. In the last year or eighteen months, it has experienced increased competition in frozen foods from a waxed paper wrap, sometimes called Tite-On (16). Butter and oleo margarine are growing uses of foil. The foil used has a backing of light

parchment, and this displaces the former wrap of a heavier parchment, sometimes in combination with waxed paper (15-16). The foil lamination is more expensive, but is used because of its greater protectiveness and the attractiveness of the foil (16-17).

During the period of 1925-1930, the principal uses of foil in terms of products were quite similar to today's uses. It was used extensively for a candy wrap and during that period its use in condensers became substantial. Alcoa has (5)
been able to increase the number of products packaged in foil over the years (12-13).

Alcoa produces plain foil, heatsealing coated foils, lacquered foil and some paper backed foil (6, 13). The various types were developed for economy or to supply an inherent weakness, such as strength in the lighter gauges (14). The development of a new type permitted Alcoa to get business for a product it could not previously package. For example, in the drug field, a heat sealable foil was necessary to get business (14). Up to about 1925, aluminum foil had not been used on high speed machines. Some paper backed foils had, but plain had not. Inability to work on high speed machinery would be a hindrance to sales. Existing machines were adapted for using foil both in the confectionery trade and in the cigarette trade. Foil is printed on the same presses that are used to print other packaging materials (14-15).

.00035 is a very important gauge of aluminum foil (16). This gauge has predominant use in the packaging field (18). 60% of foil sold for packaging is .00035 gauge and it competes favorably with cellophane. Having in mind the extra

cost of lamination, protective coating or heatsealing coating, Mr. Torrence believed that aluminum foil is within the competitive price range of moistureproof cellophane (30).

Heavier gauges are used to hermetically seal a package. The range of .0015 to .00035 is a fair representation of (6)

the range used for packaging. Gauges even lighter than .00035 have been used in the cigarette field (18). 60% of the .00035 goes to packaging (19).

In the range of gauges .0015 to .00035, the lowest possible price per unit yield would be .00035. According to Alcoa's price list of February 28, 1949, the price per thousand square inches for .00035 would be 1.9¢; for .00065, 3.2¢; and .0015, 6.4¢ (20-22).

Gauge .00035 foil is used unsupported for packaging chocolate products (22). For packaging potato chips, .00035 gauge foil is used backed with paper, glassine or occasionally cellophane (30). Lamination with various materials can add various qualities to foil as a packaging agent. Lamination is usually done to improve strength rather than to improve moisture protection (30-31). .00035 is used in packaging chewing gum although some .0003 has been used. The normal film today for cigarette packages is .00025 although .00035 has been used in the past. .00035 has been used for powders although heavier gauges have been used (31).

Laminated foil costs approximately one-third more than plain foil. A coating to protect the surface of the foil would practically double the cost of the .00035 gauge (22-23).

Gauges of foil from .0015 to .00035 are subject to pinholes. Gauges from .0015 up would be moistureproof in the

(7)

sense that no moisture will pass through. These gauges are used to some extent in flexible packaging, but not as much as the lighter gauges (23-24). It is not true that plain foil does not have a low moisture vapor permeability because it cannot be heatsealed, but some moisture will pass through the unsealed portion (24-25). Foil's dead folding characteristic gives it a tight seal when it is bent over (29). Application of a heatsealing coating about doubles the cost of .00035 gauge. Such a coating can be added to that gauge, but is not commonly done (24-25). Heatsealable foil is not used for chocolate candy (28).

.00035 gauge foil is not moistureproof because of pinholes and because without coating it cannot be heatsealed, but it competes with other flexible packaging materials in fields where moisture vapor permeability must be low (25-26). Moisture vapor permeability is an important factor in the packaging field (26). Gauges of aluminum foil from .0015 and lighter, although not absolutely moistureproof, do resist the passage of moisture vapor. No flexible packaging material is absolutely moistureproof (29). Moisture permeability is determined by tests which gauge the speed with which moisture vapor passes through the material, and all the materials permit the passage of moisture vapor to some extent sooner or later (29-30).

(8)

The ability of foils to resist moisture vapor transmission is one of its selling points. Tests have been run on both coated and uncoated foil in comparison with other materials. In these tests Alcoa accepts the other manufacturer's figures for his materials (32-33). Ratings are published for moist-

ure vapor permeability of aluminum foil with pinholes (33-34). The moisture permeability ratings of packages published in Modern Packaging Encyclopedia are essentially correct (35).

Opacity is a basic attribute or virtue of foil. If a customer says he must have transparency in his wrapper, Alcoa cannot sell him foil unless it can convince him that transparency is not as important as he thinks (26-27). With foil the same eye appeal can be developed as to a package of a beautiful product and of a grotesque product. The intrinsic beauty of the unwrapped product cannot be manifest when it is wrapped in foil, but this seemed farfetched to Mr. Torrence in connection with food products. The eye appeal of foil comes from the wrapper itself and not from the product (27-28). A picture of the product can be printed on foil, and this is often done. Pictures of the product are also printed on waxed papers and on cellophane (32). The outer wrapper of the Wrigley gum package is a complete opaque overprint, but Mr. Torrence was not positive that it was cellophane (32).

(9)

Although a .00035 gauge is used in unsupported form only on candy bars, it is in competition with cellophane and with all flexible packaging for all products. All foils, plain, coated and laminated, are in competition with cellophane (34-35).

D.X. 1009-A

Defendant's Torrence Exhibit 1

DEPARTMENT OF JUSTICE
WASHINGTON, D. C.

Address Reply to
"The Attorney General"
And Refer To
Initials and Number
HGM:MAH
60-32-13

August 2, 1951

Aluminum Company of America
801 Gulf Bldg.
Pittsburgh 18, Pennsylvania

Re: United States v. E. I. du Pont de Nemours and Company
Civil Action No. 1216 (Delaware)

Gentlemen:

Certain issues raised by the defendant during the course of the subject litigation, which is now pending in the United States District Court at Wilmington, Delaware, are concerned with products of the type manufactured by your company. Whereas the Government strenuously contends that facts pertaining to the materials manufactured by your company have no place in the trial of an issue confined to monopolization of the cellophane industry, nevertheless it may become necessary to meet the defendant's position. Consequently, it is essential for the Government to ascertain certain facts relative to the production, use and sale of these products. It is probably desirable for all concerned that

this end be accomplished by means of your voluntary cooperation.

There is attached a series of inquiries, answers to which will immeasurably assist the Government's presentation. Some may be answered directly, upon recourse to your books and records; others either call for or are more easily answered by submittal of documents contained in your files. It is requested that your company supply the information and documents sought by the interrogatories contained in the annexed list, to the extent that they are applicable to its operations. Copies, in lieu of original documents, and summary statements or schedules in lieu of original accounting records will be adequate.

If you desire oral explanation of any items included in this request, Mr. Julius C. Renninger of my staff will be available in Washington to confer with your representatives in person or by telephone.

Due to the shortness of time before the resumption of trial in the above entitled case your prompt cooperation will be appreciated.

Sincerely yours,

/s/ H. G. Morison

H. G. MORISON
Assistant Attorney General

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343342 O - 55 - vol 8 - 24

Information Requested

1. Furnish periodic accounting statements, summaries and reports (or schedules prepared from original records) designed to show in statistical form, for each calendar year or other annual accounting period from 1940 to date, the aggregate production in units of quantity or measure customarily used, and the total value of sales, by your company of each of the individual types and weights of flexible packaging materials of the kinds and categories enumerated below or as sold by your company:

   a. Glassine
      (1) plain
      (2) waxed
      (3) lacquered
      (4) laminated
      (5) bleached
   b. Waxed paper
      (1) plain
      (2) others
   c. Waxing-coated opaque wrapping paper
   d. Vegetable parchment
   e. Greaseproof
      (1) plain
      (2) bleached
   f. Sulphite bag and wrapping paper
   g. Cellulose acetate
   h. Ethyl cellulose
   i. Cellulose acetate butyrate

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j. Vinyl films (Vinyl chloride and others)
k. Saran
l. Polyethylene (polythene)
m. Pliofilm
n. Aluminum foil
o. Tin foil
p. Lead foil
q. All other flexible wrapping materials. (By each type or classification.)

2. State, to the extent that such information is available to you, what percentage of the sales of the individual products manufactured by you and listed in paragraph 1 is for use as a flexible wrapping material.

(2)

3. State the ratio of your sales of the products listed in paragraph 1 to the total sales of all products manufactured and sold by your company.

4. Furnish copies of all published price lists, discount schedules, bulletins, circulars and notices to the trade issued by your company from 1940 to date, showing:
   a. List prices, discounts, and terms of sale applicable to any and all of the kinds of flexible wrapping materials enumerated in paragraph 1.
   b. Changes in such list prices, discounts, or terms of sale.

5. State the principal commercial use or uses of each of the products listed in paragraph 1 manufactured by your company. State, to the extent that such information is within your knowledge, which of these prod-

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ucts are being profitably and commercially used as a flexible wrapping material for the wrapping of:

a. Chocolate or chocolate coated candy
b. Variety bread
c. Cookies and wafers
d. Fresh sausage
e. Ham, pork shoulder butts, and slab bacon
f. Powdered drink mixes
g. Nuts and dried fruits
h. Cheese
i. Fresh vegetables
j. Potato chips
k. Cigarettes
l. Cigars and tobaccos
m. Toys and games
n. Frozen foods
o. Drugs
p. Cosmetics and toilet goods
q. Poultry and fish
r. Hosiery
s. Tea and coffee
t. Rubber goods

(3)

6. State, to the extent that such information is within your knowledge, what percentage of each of the items listed in paragraph 1 manufactured by your company is used in each of the categories listed in paragraph 5.

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7. State the principal physical characteristics of each of the products listed in paragraph 1 manufactured by your company in relation to:

   a. Heat sealability
   b. Printability
   c. Clarity
   d. Tear strength (Elmendorf or other test)
   e. Bursting strength
   f. Water absorption in 24 hours immersion
   g. Moisture permeability
   h. Permeability to gases
   i. Dimensional change with humidity difference
   j. Resistance to greases and oils
   k. Wrapping machine running qualities
   l. Odor yielding

D.X. 1009-B

Defendant's Torrence Exhibit 2

August 31, 1951

RE: UNITED STATES V. E. I. DU PONT DE NEMOURS AND COMPANY, CIVIL ACTION NO. 1216 (DELAWARE).

ANSWERS OF ALUMINUM COMPANY OF AMERICA TO QUESTIONS ASKED BY DEPARTMENT OF JUSTICE IN LETTER FROM H. G. MORISON, ASSISTANT ATTORNEY GENERAL, DATED AUGUST 2, 1951.

Answer to Question 1.

Aluminum foil, Item (n), is the only type of flexible packaging materials produced and sold by Aluminum Company of America. Production in pounds of aluminum content and value of sales of aluminum foil for 1940 through June, 1941, are as follows, for this company:

Year	Production	Value of Sales
	#	$
1940	7,944,750	3,971,947.55
1941	3,544,275	1,597,474.93
1942	831,540	348,910.59
1943	3,334,819	1,666,587.79
1944	12,625,492	7,468,952.72
1945	15,013,928	6,780,014.82
1946	12,615,875	5,874,699.57
1947	11,555,111	6,318,167.25
1948	14,855,951	8,677,336.74
1949	12,326,608	7,545,145.28
1950	26,192,598	14,084,375.08
1951—Jan. through June	15,711,767	8,565,275.80

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~~D.X. 1009-B~~

Question 2: State, to the extent that such information is available to you, what percentage of the sales of the individual products manufactured by you and listed in paragraph 1 is for use as a flexible wrapping material.

Answer: Aluminum Company of America has no records which would enable it to answer this question.

Question 3: State the ratio of your sales of the products listed in paragraph 1 to the total sales of all products manufactured and sold by your company.

Answer:

Year	Percentage of Foil Sales to Total Sales
1940	2.2%
1941	.7
1942	.1
1943	.3
1944	1.2
1945	1.6
1946	2.4
1947	2.2
1948	2.6

(2)

Year	Percentage of Foil Sales to Total Sales
1949	2.9%
1950	3.6
1951—Jan. through June	3.8

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Question 4: Furnish copies of all published price lists, discount schedules, bulletins, circulars and notices to the trade issued by your company from 1940 to date, showing:

a. List prices, discounts, and terms of sale applicable to any and all of the kinds of flexible wrapping materials enumerated in paragraph 1.

b. Changes in such list prices, discounts, or terms of sale.

Answer: See price schedules attached. { Photostated price list, consisting of 27 pages, retained in Wilmington files.

Question 5: State the principal commercial use or uses of each of the products listed in paragraph 1 manufactured by your company. State, to the extent that such information is within your knowledge, which of these products are being profitably and commercially used as a flexible wrapping material for the wrapping of:

a. Chocolate or chocolate coated candy
b. Variety bread
c. Cookies and wafers
d. Fresh sausage
e. Ham, pork shoulder butts, and slab bacon
f. Powdered drink mixes
g. Nuts and dried fruits
h. Cheese

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i. Fresh vegetables
j. Potato chips
k. Cigarettes
l. Cigars and tobaccos
M. Toys and games
n. Frozen foods
o. Drugs
p. Cosmetics and toilet goods
q. Poultry and fish
r. Hosiery
s. Tea and coffee
t. Rubber goods

Answer: The principal commercial uses of aluminum foil are: flexible packaging, electrolytic and paper condensers, dairy closures, bottle cap liners, household and locker foil, insulation and moisture vapor barriers, and labels.

Aluminum foil either alone or combined with supplementing products as papers, paperboard, cellulosic and non-cellulosic plastic films, textiles, etc., is used to a large extent in

(3)

the packaging industry. It is commonly used for decorative and protective wrappers in bags, containers and closures.

Aluminum foil alone, coated for protection, heat sealing or decoration and/or combined with other flexible wrapping materials or sup-

porting sheets is used for wrapping or in preparing containers for packaging:

a. Chocolate or chocolate coated candy
b. Specialty breads with overwraps, bands or end pieces
c. Cookies and wafers—decorative packages, some wrappers
d. Fresh sausage (not satisfactory unless frozen)
e. Hams (but pork is not generally wrapped in foil unless frozen)
f. Powdered drink mixes
g. Nuts and dried fruits
h. Cheese
i. Fresh vegetables—home use, and liners for shipping crates.
j. Potato chips (bags)
k. Cigarettes
l. Cigars—foil closures for cigar tubes. Pipe Tobaccos—Packed in pouches and packs containing foil.
m. Toys and games. Foil used in making and in their decorative wraps and boxes.
n. Frozen foods. Locker foil. Also overwraps, foil-lined bags and cartons.
o. Drugs. Heat sealed packets for individual units.
p. Cosmetics and toilet goods. Wraps, foil lined and covered boxes.

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q. Poultry and fish. Frozen food wraps.
r. Hosiery. Gift wraps and boxes.
s. Tea and coffee. Sealed packets for powdered coffee. Foil liners or wraps for tea.
t. Rubber goods. Containers and sealed packets for mechanical contraceptives.

Question 6: State, to the extent that such information is within your knowledge, what percentage of each of the items listed in paragraph 1 manufactured by your company is used in each of the categories listed in paragraph 5.

Answer: Aluminum Company of America has no records which would enable it to answer this question.

(4)

Question 7: State the principal physical characteristics of each of the products listed in paragraph 1 manufactured by your company in relation to:

a. Heat sealability
b. Printability
c. Clarity
d. Tear strength (Elmendorf or other test)
e. Bursting strength
f. Water absorption in 24 hours immersion
g. Moisture permeability
h. Permeability to gases
i. Dimensional change with humidity difference

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j. Resistance to greases and oils
k. Wrapping machine running qualities
l. Odor yielding

Answer: a). Heat Sealability.

Aluminum Foil is not heat sealable without a thermoplastic coating. Satisfactory thermoplastic coatings are available for application to aluminum foil. When suitably coated, the foil can be readily heat sealed and such coated foil is heat sealed on a commercial basis.

b). Printability.

Aluminum foil is readily printable by the use of suitable inks.

c). Clarity.

If by clarity, transparency is meant, the answer is that aluminum foil is opaque.

d). Tear Strength.

The Elmendorf test tear strength varies with the thickness, and aluminum is not particularly well suited for testing by this method. Hence, the values obtained are not easily reproducible and those listed below are given merely to indicate the range of tear strength obtained in tests. Aluminum foil is furnished in the annealed and in the hard tempers. There are indications that the tear strength of annealed foil in the thin gauges is slightly higher than that of hard foil, whereas, in the heavier

gauges, namely, above about .001", the tear strength of the hard foil is slightly above that of the annealed foil.

The values given below are submitted merely to serve as indication, and to show that the tear strength increases materially with thickness.

Gauge	Tear Strength
.00025"	4 grams
.0005"	9 grams
.001"	25 grams
.002"	75 grams

(5)

e). Bursting Strength.

Bursting strength of aluminum foil by the Mullen test is subject to considerable variation for which reason the values given below showing the bursting strength of annealed foil in various thicknesses are merely given to indicate the range of strength to be expected. Tests indicate that the bursting strength of hard foil is slightly higher than that of annealed material.

Thickness	Bursting Strength
.00025"	3 lbs. psi
.005"	6 lbs. psi
.001"	15 lbs. psi
.002"	50 lbs. psi

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f). Water Absorption in 24 Hours Immersion.

Aluminum foil does not absorb water.

g). Moisture Permeability.

In the absence of pinholes, aluminum foil is impermeable to moisture. Aluminum foil in thicknesses over about .0015" is substantially free from pinholes.

h). Permeability to Gases.

In the absence of pinholes, aluminum foil is impermeable to gases at room temperature. Aluminum in thicknesses over about .0015" is substantially free from pinholes.

i). Dimensional Change with Humidity Difference.

Differences of humidity have no effect upon the dimensions of aluminum foil.

j). Resistance to Greases and Oils.

Aluminum foil is completely unaffected by neutral oils and greases.

k). Wrapping Machine Running Qualities.

Aluminum foil is regularly processed through commercial types of wrapping machines.

l). Odor Yielding.

Aluminum foil has no odor unless coated with a substance which itself yields odor.

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(1)

NARRATIVE SUMMARY OF DEPOSITION OF IRVING HORN

Taken January 23, 1952 at New York, N. Y.

Irving Horn, who resides in Great Neck, N. Y., appeared by subpoena (2, 29). He is General Purchasing Agent for the General Foods Corporation* and has been in purchasing activities since March, 1929. Mr. Horn, or his office, purchases substantially all packaging material requirements of GF, in consultation with other departments—Research, Sales and Advertising, Merchandising, Production, Consumer Service, etc. (2-3). Members of Mr. Horn's staff share with other departments the responsibility for selecting and designing a wrap, though Mr. Horn does not have individual responsibility. His group contribute information as to costs, availability of materials, reliability of source of supply, and so on (30-31). He is aware of the factors of selection (65).

GF's principal products wrapped in cellophane are: cereals, Birdseye frozen foods, chocolate bars, cocoanut, and D-Zerta (a sugar free gelatin dessert) (3). Frozen fruits packaged in syrup are not in cellophane (3). The wrapping of frozen fish fillets was the first use of cellophane by GF, in 1930. In 1931 GF began using cellophane in packaging of frozen vegetables and fruits (4). Where GF uses cello-

(2)

phane as an inner-wrap or liner it is for protection. Generally speaking, GF uses cellophane primarily for its protective properties, but also for merchandising appeal (47-48).

*Referred to hereinafter as GF.

GF used 2,423,066 lbs. of cellophane in 1950; 1,869,620 lbs. in 1951; 400,000 lbs. in 1940 and 610,093 lbs. in 1945. The increase over this ten year period is mainly attributable to the growth of GF's volume of overall business and to proportionately increasing sales of all types of packages (4-6). Mr. Horn ascribed a small part of this increase to new uses of cellophane (5), some of which in the last twenty years have been cocoanut bags, cereal bags, and bags for chocolate chips, and Post-Tens (a package of ten small boxes of cereals). (54-55).

GF can obtain enough cellophane to cover its current requirements and desires, though it is still on allocation (22, 59-60). If GF could get all the cellophane it wanted today, it would not use it on any other products (60-61). GF's monthly allocations are:

From du Pont, a little over 200,000 lbs.
From Sylvania, 40,000 to 50,000 lbs.
From Olin, no formal allocation (59-60).

GF felt a shortage of cellophane during World War II and in the spring of 1950 when cellophane had to be removed from some packages (60). During the latter period foreign cellophane was offered at higher cost than domestic, which (3)
GF was prepared to pay in order to get cellophane for uses where other materials were thought unsuitable. Lack of uniform quality shown by laboratory tests, lack of service and a requirement that GF would have to take a considerable portion of any purchase in non-moistureproof film led GF to refuse foreign cellophane supplies (61-62, 76-77). If foreign cellophane were available at the same price to GF

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as domestic cellophane, GF would not buy foreign cellophane as a regular source of supply. The most important factor in this is that the quality of domestic cellophane is much superior and more uniform. Other factors would be the lack of service from the foreign sources, and GF's strong preference for dealing with domestic sources of supply (76-77). GF made laboratory tests on foreign cellophane as recently as the spring of 1950 (78-79).

Other shortages during World War II were glassine, aluminum foil, waxed and unwaxed papers and all flexible packaging materials generally (72-73).

GF's purchases of cellophane have been mainly direct from cellophane manufacturers (25) and direct purchases were exclusively from du Pont from 1930 until 1937 or 1938 (22). GF used cellophane in the manufacture of its own frozen food cartons, and thought it should be considered a converter for that use (23). "Converter", as a word used (4)
in the trade, is not applied to one who does not resell packaging materials (29-30, 67). Du Pont would not agree to give GF the 10% converter discount, but Sylvania did and GF began purchasing exclusively from Sylvania at that time. Sylvania allowed GF the 10% discount on its entire direct purchases of cellophane for all purposes (68). At the end of two years Sylvania film had caused so much mechanical and heat-sealing difficulty and degradation of GF's products that GF shifted back to exclusive du Pont purchases, even though it was at some additional cost in the purchase of the film (22-23, 58). This fault of Sylvania film has since been overcome and GF now buys from du Pont, Sylvania and Olin (24, 33, 58). The prices of all three are comparable (57-58). GF has not received

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any converter discount from any supplier since it bought exclusively from Sylvania (69).

GF has conducted since 1934 or 1935 a cellophane "converting operation" in its Battle Creek plant, applying cellophane liners to frozen food cartons, as a cost saving and to use existing equipment. GF also makes some of its cellophane bags (23, 33-36). This converting was GF's own idea, for cost saving and utilization of existing equipment (36).

Uniformity of film, of sealing properties and the standard of moisture resistance of Sylvania and du Pont cellophane have been considerably improved since GF began using cellophane (24).
(5)

The small volume of converted cellophane bought by GF, printed or in bag form, comes from Milprint and Nashua Gummed and Coated Paper Co. (25).

The process of selection of a packaging material by GF follows these steps:

1. Determination of type and degree of protection the package must provide.
2. Determination of size and shape of package, and whether it is to be flexible or rigid.
3. Tentative selection of materials which satisfy the functional requirements of the product.
4. Laboratory tests to determine which materials will give the best protection against moisture, grease, odors, etc.
5. Selection, from materials that have most satisfactorily passed this test, of those which are available and most reasonably priced.

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6. Experimental plant runs with the chosen materials.
7. Physical tests of the selected materials simulating conditions that package will encounter.
8. Final selection by interested departments from those materials so far qualified, on the basis of functional performance, price, merchandising, appeal, etc. (6-8, 31).

The price of a flexible packaging material is a very important factor, since GF sells primarily staple products, and not "luxury" packages (8, 55). Tradition is also a factor to be weighed in selection, since consumers are accustomed to certain packages for certain products but tradition does not itself prevent a change if other factors indicate one (63-64).

The steps and considerations involved in the replacement of an existing package and packaging material are (6) substantially the same (28-29).

GF uses rigid containers, cans, glass containers and paper canisters for a variety of its products such as salt, syrup, cat food, coffee, Jell-O, cocoa and some fruits and vegetables (62-63). About 10% of dollar purchases for packaging materials go for flexible materials (63, 77). Individual opinions differ within GF as to the type of package to be used for its products (70).

Cellophane has comprised 15 or 20% of all flexible packaging materials used by GF, waxed paper, glassine, and aluminum foil making up the bulk of the total (18-19). Pliofilm, Saran, and polyethylene have been used experimentally (19, 42-43). Declines in the price of cellophane

over the years have made it possible for GF to increase its use for lower-priced products such as cereals (19-20).

GF has used only moistureproof cellophane, and would not use the plain, if moistureproof were not available (20, 72). The disadvantages of cellophane compared to other flexible packaging materials are its high cost, relatively poor mechanical handling qualities, brittleness at low humidity (and formerly at lower temperatures), and its low bursting strength (20-21).

The variety of flexible packaging materials used by GF on products on which cellophane is used is outlined below: (7)

Cereals

Cellophane is used for duplex bags for puffed cereals, for individual carton overwraps (as extra moisture protection for hot humid markets where other wrappers are not adequate) and as an overwrap for the tray unit of ten cartons, known as "Post Tens" (8-9, 46). Duplex cellophane bags were used as the original package for a presweetened cereal, "Sugar Crisp", but the bags were difficult to stack for display in stores, and became easily split or damaged, thus permitting moisture to enter and congeal or "block" the contents. This bag was replaced by the present package at about the same cost, which is a waxed paper liner in a carton, a foil overwrap and a printed waxed paper overwrap over that (11-12, 29, 73). This package can be stacked in the stores, is less easy to spill, is easier to reclose in the home, has better merchandising appeal and more attractive appearance than the cellophane bag (11-12). The package is highly colored to create impulse purchases.

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GF does not plan to return to the cellophane bag for Sugar Crisp because of the many advantages of the current package (12). The abandonment of cellophane for Sugar Crisp eased the impact of the cellophane shortage, though this was not the reason for dropping the cellophane package (11-12, 60, 73).

A cellophane overwrap replaced a transparent waxed glassine carton liner for Grapenuts around 1939, in an effort for added moisture protection and merchandising appeal. (8)

The cellophane so limited transmission of air that the Grapenuts would turn rancid in the package. Cellophane was abandoned and Grapenuts are now in the standard GF cereal carton: a waxed paper liner of glassine, sulphite paper or sulphate paper; a carton; and a printed waxed paper overwrap (13, 55-56). The price of cellophane did not induce the change (13-14). Other wrappers are used on individual cereal cartons for sales in the Central Eastern and Northern portions of the United States, but cellophane is used on such cartons for sales in Southern United States, where other materials do not give adequate protection because of the hot and humid climate (46).

Chocolate Bars

Unprinted cellophane, foil and glassine are used interchangeably as the primary chocolate bar wrap, under a printed paper wrapper, in amounts depending upon the available supply of aluminum foil and cellophane (9-10, 63). Mr. Horn considered foil the ideal and traditional wrap for GF's chocolate bars (63).

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Cocoanut

GF's dry shredded cocoanut is on the market in two alternative packages: a double walled cellophane bag, and a carton with an inner wrap of foil and glassine, both packages intended to prevent the transmission of cocoanut oil or oxygen through the package (10, 64). There is a (9)
market for each type of package, and each sells at the same price (64).

Frozen Foods

GF sells frozen fruits, vegetables, seafoods and poultry. In frozen food packaging GF uses cellophane as a liner or inner wrap inside the carton, not as an overwrap for the carton, though other producers use it as an overwrap (14-15). GF buys some cartons of frozen foods from "co-packers" which do not employ a cellophane liner (69-70). Parchment was once used as the inner wrap or bag for frozen fish and frozen fruits packaged in syrup (16), and was replaced by cellophane for fish (14). Frozen poultry was first packaged in Cry-O-Vac, but GF switched to cellophane eight or ten years ago because of mechanical production difficulties with Cry-O-Vac (17-18, 45-46).

GF does not use a cellophane overwrap for frozen food cartons because of the cost, which GF does not consider justified by the additional protection the cellophane overwrap might give (15). GF's overwrap on frozen food cartons is a printed waxed paper, produced by Marathon, Western Waxed Paper Co., or printed and waxed by GF itself (15).

Jell-O

GF has considered the use of cellophane on Jell-O packages, but has not used it because of the approximately (10) $1,000,000 additional annual cost (14).

Tea.

Cellophane was first adopted as a liner for tea packages in 1939 replacing a glassine liner. During subsequent cellophane allocation in World War II, GF went back to a glassine liner because of insufficient allocation. When allocations were ended after World War II, GF adopted a cellophane overwrap and abandoned the glassine liner. When cellophane again went on allocation in early 1950, the cellophane overwrap was replaced by a glassine inner liner, which is still used (17, 56). Cellophane had been adopted primarily for merchandising appeal, plus greater protection (57). GF would not go back to cellophane for tea now because the present package is satisfactory and cellophane would increase GF's cost (60-61).

GF purchases aluminum foil from Reynolds Metal Company, Betner Bag Co., Riegel, Dobeckmun and Milprint; glassine from Riegel, Westfield Paper Co., Rhinelander Paper Co.; waxed and waxing paper from Kimberley-Clark, Detroit Sulphite, Frazer Paper, Kalamazoo Vegetable Parchment Company, Marathon, Pacific Waxed Paper Co., Western Waxed Paper Co., Specialties Paper Co., and Whitehead & Alliger (25-26). In the last fifteen or twenty years significant improvements in all of these materials, particularly in mechanical handling characteristics, strength, printing surface and clean appearance, have been made (26-27).

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(11)

Mr. Horn compared prices of other flexible packaging materials used by GF with the cost of cellophane; waxed paper, glassine, sulphite, and vegetable parchment are cheaper than cellophane, waxed paper and glassine particularly. Aluminum foil is more expensive (41-42). Varieties of laminated and coated glassine are comparable with cellophane in price per 1000 square inches, though GF does not buy them (75). GF does not use cellulose acetate, Pliofilm, polyethylene, Saran or Cry-O-Vac, commercially, but prices run $.65 or $.70 a pound (42-43). GF has been testing these films since they appeared, however, and Mr. Horn believed their protective qualities are about the same as cellophane in that they afford higher resistance to moisture, water, fats and oils than do waxed paper, glassine, sulphite and vegetable parchment (43-44).

The films not used commercially by GF have been found to have certain disadvantageous features:

Pliofilm tends to stretch, is more difficult than cellophane to handle on machines, has electric static;

Polyethylene is brittle at low temperatures and has electric static;

Cellulose acetate is brittle at low temperatures, is higher priced than cellophane and has no dependable supply for large volume use such as frozen foods carton liners;

(12)

Cry-O-Vac stretches and requires much manual handling (44-45, 58-59).

Mr. Horn is a member of GF's Packaging Committee on which points of view of different departments are repre-

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sented, and problems relating to packaging materials in use and new materials available are discussed (50). His contribution is primarily in the realm of cost and availability of packaging materials, and he does not necessarily participate in discussions of other factors, such as merchandising appeal (50-51). Where visibility of the product is desired, Mr. Horn believes that waxed paper, aluminum foil, sulphite and glassine would not afford as suitable transparency as cellophane, though sulphite and glassine have a degree of transparency in some grades (52). In addition to transparency, cellophane has a luster and brilliance which is an aid to merchandising (52-53). Transparency plus luster give what is called eye appeal, and cause impulse buying (53, 55). Waxed paper, glassine, sulphite, vegetable parchment and aluminum foil each also has eye appeal, based on its properties (53-54).

It is not fair to say that every product to be packaged has properties and characteristics that will determine as a sole factor the type and construction of the package to be used. GF has a large business in coffee, which it packages (13)
primarily in metal containers, has at times packaged in glass, and regularly packages in glassine lined paper bags (54). GF is alert to new materials for use in food packaging, and tests them as they become available for possible use on its products. Competitors' packages of different materials are also tested. GF never limits itself to one type of package as the only one it must continue to use. For any given product, there are normally a number of flexible packaging materials available from which it can select (16, 71, 75). GF also has a choice in other types of packaging, such as cans, cartons, etc. (78). The decision as to type of wrap is based on cost,

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reliability of supply, technical performance of the material, merchandising and sales appeal, and machine operation (31, 47, 51). Whether cellophane is a better protective wrapper than wax paper, glassine, sulphite and vegetable parchment depends on the product; for some products it is, for others it is not (43). One cannot say with any exactitude that one product requires a transparent wrap and another does not. GF has products not wrapped in cellophane, and is as anxious to sell them as it is to sell others (70-71). Eye appeal is a factor created by opaque wraps; GF hopes all its packages have eye appeal (71). The printed outer paper wrap on the cereal carton, for example, is used to create eye appeal (71-72).

(14)

Protection is GF's primary concern in packaging, and except on a few items visibility is not important (78).

The growth in recent years of self-service retailing has placed more emphasis upon attractive consumer packages that afford attractiveness and merchandising appeal. GF makes an effort to keep abreast of this with greater eye-appeal in its packages, but has not experienced a trend toward transparent packaging (27-28). Its opaque packages are designed with a view to eye appeal and impulse selling (27-28).

GF is not particularly interested in visibility of its products through the wrapper, except in the cases of cocoanut, puffed cereal and chocolate chips. GF either followed competition or has been followed by competition in the adoption of cellophane for these products, and for Post-Tens, for merchandising considerations (48-51).

Mr. Horn was familiar with a letter dated January 14, 1952, to the Department of Justice signed by John A. Riegel,

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a member of the Law Department of GF (32, 66). A copy of this was sent by GF to the du Pont Company as a matter of courtesy and business goodwill (32, 66). Mr. Horn has supplied information requested by the du Pont Company; no copies of which were sent to the Antitrust Division (32-33). Goodwill also exists between GF and the United States Government (79). The letter was marked Horn (15)
Exhibit 1 for identification (35).

Mr. Horn believed there is a reasonably distinct and separate market for flexible packaging materials, though there is some overlap between flexible and non-flexible materials. The market is principally in consumer-size prepackaging (28).

When GF first started purchasing cellophane it received a quantity discount from du Pont within the range of 2½ to 5% depending on the volume purchased (36). Quantity discounts received by GF over a period which includes two years of exclusive purchases from Sylvania (22-23) are as follows, listed by dates of receipt of the discount payment:

7/17/36	$ 4,526.95
9/30/36	1,970.65
9/22/37	10,274.08
9/16/38	11,127.08
11/21/38	1,049.79
9/21/39	12,164.64
9/17/40	10,640.33
9/17/41	9,478.62
9/28/42	28,875.05
9/28/43	18,112.05
2/15/44	15,023.39
9/25/44	9,783.26
9/28/45	6,509.95

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Period 1944-1945	8,141.16
" 1945-1946	25,882.41
" Sept.-Dec. 1946	7,396.80

Part of the remittances received during this last period covers discounts for Cel-O-Seal, not cellophane (37-38). (16)

Mr. Horn thought these figures include quantity discounts from Sylvania (40), there being no other explanation of the figures for the period GF, to Mr. Horn's certain knowledge, purchased exclusively from Sylvania (39-40, 67-68). The rate of discount was based on total yearly purchases (40). The quantity discount rate from Sylvania was identical to that offered by du Pont (41). Quantity discounts are an inducement to purchase total requirements from a single source (40). Sylvania gave GF an additional converter discount on top of the quantity discount (41). It was in spite of this additional inducement, GF returned to buying exclusively from du Pont, and had to give up the converter discount (74).

GF has received no quantity discount from any supplier of cellophane since December 1946 (69).

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(1)

NARRATIVE SUMMARY OF DEPOSITION OF SAMUEL LEEDS

Taken January 23, 1952 at New York, N. Y.

Samuel Leeds, who resides in White Plains, N. Y., appeared pursuant to subpoena (2). Mr. Leeds is President of Cellu-Craft Products Corporation, located in Flushing, N. Y. The company was incorporated in 1946, and Mr. Leeds was a partner in the predecessor company which was formed in October, 1937. Prior to that time Mr. Leeds was a salesman selling transparent glassine envelopes for the Mason Envelope Company from 1932 to 1937 (2-3).

Cellu-Craft was founded to manufacture and sell a combination bag that Mr. Leeds had devised with a glassine back and a cellophane front for packaging such textiles as blouses, shirts, underwear and scarves (3-4).

Cellu-Craft developed its facilities from hand to semi-automatic and then to fully automatic operation. In 1937 it took eight hours for a girl to make 2,500 bags by hand, whereas now one man on a machine can make 100,000 bags in that time. Cellu-Craft started with one plant and now has two completely mechanized plants. Its sales spread

(2)

into various branches of the entire food industry and textile industry, greatly increasing its production. Its 1937 volume of business was approximately $70,000 and its 1951 volume approximately $2,000,000 (5-6).

Cellu-Craft converts a number of materials including glassine, cellophane, Pliofilm, acetate, parchment, aluminum foil, bond paper and polyethylene (6). Its principal prod-

ucts today are wraps for frankfurters, sausages, and bacon. Frankfurter wraps are the most important item of business (7). Cellu-Craft still makes combination bags both with a full face and a window effect for wrapping textiles (7). It also sells anchor coated cellophane materials and Pliofilm for the packaging of fresh produce (7-8). The most important outlets for Cellu-Craft products in order of importance are wraps for meats, textiles, greeting cards, candy and industrial uses (8).

Cellu-Craft currently buys cellophane from du Pont, Olin and Sylvania. Its purchases are divided about 40% each from du Pont and Olin, and the remaining 20% from Sylvania (8-9).

When Cellu-Craft went into business in 1937, it first approached Sylvania as a supplier of cellophane. Sylvania (3)
refused to sell to Cellu-Craft. Mr. Leeds then approached Mr. B. Y. Bandy, a du Pont salesman, and explained his ideas for the combination bag and a greeting card wrapper. Mr. Bandy showed some interest and agreed to sell Cellu-Craft on a c. o. d. basis. Cellu-Craft has purchased from du Pont more or less regularly ever since (4-5).

Cellu-Craft first purchased Olin cellophane in July, 1951 (9). It purchased Sylvania cellophane only from time to time on a spot basis, prior to 1948 (9, 97). During that period Cellu-Craft was not treated as a converter who could get monthly allocations from Sylvania, but did get the converter discount (9). Beginning in January, 1948 Sylvania offered Cellu-Craft a definite commitment on a monthly basis, and Cellu-Craft has purchased substantial quantities regularly from Sylvania since that time (9-10, 98). Cellu-

Craft then became a Sylvania converter, in the sense of obtaining a definite allocation, and is now a du Pont-Sylvania-Olin converter (99-100). Being termed a producer's converter means only that you are buying from the producer (100).

Cellu-Craft did not buy from Sylvania in any quantity prior to 1948 because Sylvania's materials did not meet the (4)
quality standards of du Pont film. Sylvania's moistureproof heat sealing cellophane did not work well on Cellu-Craft machinery. Du Pont's moistureproof heat sealing cellophane worked successfully (10). A much improved heat sealing cellophane was available from Sylvania early in 1950 (10). Cellu-Craft has rarely experienced any difficulty with du Pont heat sealing cellophane, but has experienced considerable difficulty with Sylvania heat sealing film (13). 1952 production of du Pont and Sylvania heat sealing film is more nearly comparable, but Mr. Leeds still prefers du Pont (13). No du Pont representative ever told Mr. Leeds not to buy film from Sylvania, or threatened to take any action against Cellu-Craft if it did buy Sylvania film (10-11).

Du Pont's moistureproof cellophane is superior to Sylvania's moistureproof cellophane with respect to uniformity and gauge (11). The yield per pound of du Pont cellophane is within a 3% range of variation, whereas Sylvania film has varied anywhere from 6 to 10% (11). The range of variation in Sylvania film caused Cellu-Craft difficulty in the production and sale of bacon wraps. Cellu-Craft's prices are predicated upon the number of sheets (5)
which can be obtained from a pound of cellophane. For

example, if 1,000 sheets of bacon or frankfurter wraps come to seven pounds, Cellu-Craft would know the cost to it per pound and would be able to determine its price for the sale of the sheets. But if the gauge varies from 6 to 10%, Cellu-Craft may lose from 5 to 7% in its figures because it cannot predict the yield (11-12). This has actually happened with Sylvania film (12).

Du Pont and Sylvania both offer a number of types of moistureproof film. Du Pont provides a larger number of specialized types than Sylvania (13). The advantage of a larger variety of types offered by du Pont is that it provides a more complete line of service (13-14). Mr. Leeds has experienced occasions when one type of du Pont moistureproof heat sealing film will do a job that another specific type will not do as well (14).

Du Pont moistureproof film performs better than Sylvania film on high speed converting machines (14). When run on high speed machines cellophane will snap if it is not uniform. In rewinding of rolls, a lack of uniformity causes the formation of a soft edge. In printing the ink will smear if the film is higher in one spot and lower in another. When two colors are used, it is impossible to (6)
get a precise juxtaposition of the colors if the film is not uniform (15).

The Sylvania cellophane which was offered to Cellu-Craft during the war years consisted of rolls of odd sizes which Sylvania could not readily sell to regular users (59, 63-64). It was called reject due to roll size, not to film grade (63-64). In addition to these rolls, Cellu-Craft received Sylvania cellophane from its customers for con-

version (64). Cellu-Craft's experience with Sylvania cellophane and Mr. Leeds' comparisons of its quality with du Pont cellophane were based on standard grades of each film, not reject Sylvania film and standard du Pont film (64, 103).

When Cellu-Craft receives complaints from a customer, it sends one of its men to the customer's plant to investigate. If he sees that the difficulty is not in the converting, but in the cellophane, Cellu-Craft calls in du Pont technicians and seeks their help in solving the problem (15-16). Cellu-Craft servicemen take along rolls of cellophane to try out in the customer's plant. These rolls are du Pont cellophane because Cellu-Craft has had cooperation from du Pont and has confidence in du Pont's willingness to help (16). There have been occasions in which a du Pont roll has worked on a machine of which Cellu-Craft's customer had complained. On these occasions Cellu-Craft has found that the trouble was caused by a roll of Sylvania cellophane (17).

At packaging shows and conventions, machinery manufacturers have used du Pont moistureproof heat sealing film for demonstrations 95% to 98% of the time in order to get the best results (17).

(7)

Cellu-Craft prefers Sylvania's non-moistureproof film to du Pont's for printing and converting (12-13). Cellu-Craft did not purchase this film from Sylvania before 1948 because Sylvania would not sell it to Cellu-Craft (112).

Du Pont helped Cellu-Craft when it entered the meat industry. In every instance when Cellu-Craft needed technical or sales advice, a du Pont man was available to go in with the Cellu-Craft salesman. Du Pont supplied promotional material in the form of market surveys. Du Pont has

developed new types of cellophane which have given Cellu-Craft the opportunity of going into new industries (18).

Cellu-Craft has received technical assistance from du Pont in connection with adhesives. Cellu-Craft has had difficulty with adhesives and did considerable work itself without much success. A call was made upon du Pont and Mr. Leeds was surprised to know that du Pont had made a survey itself and recommended certain adhesives. Du Pont had also studied the ink problem and recommended certain inks (18-19).

Cellu-Craft had difficulty at first with the wrapping of textiles. It found that certain garments discolored when wrapped in cellophane, and Cellu-Craft's customers held it responsible for the discoloration. This experience was the (8)
first time Mr. Leeds realized that a particular type of cellophane could not be used for every purpose. Du Pont was called in and confirmed that a wrong type of cellophane was being used. Du Pont furnished a film that removed the discoloration problem (19-20, 83-84). Cellu-Craft learned from du Pont the proper presentation of cellophane to users. For example, the wrapping of a plastic apron in a cellophane bag would require information concerning the effect that the apron would have on the cellophane. Cellu-Craft learned this information from du Pont. Du Pont's technical advice was important at that stage (83).

Du Pont's sales assistance included teaching Cellu-Craft salesmen different sales approaches. They were invited to Wilmington to study the fundamentals of the manufacture of cellophane and proper sales presentation. Du Pont salesmen made joint calls with Cellu-Craft salesmen, and also with Mr. Leeds (20).

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Du Pont has referred customers to Cellu-Craft, especially for the combination bags which it had developed (20). Cellu-Craft was the only company producing the combination bags during its first year and a half in business, but then others came into the field. In 1940, there were quite a few companies making combination bags (21). Du Pont furnished Cellu-Craft with reprints of cellophane advertising. (9)
Cellu-Craft turned these over to its salesmen who followed up the industry to which the du Pont ad had been directed. This was helpful to Cellu-Craft (21). The value of du Pont's technical and sales assistance is difficult to measure, but Mr. Leeds regarded this assistance as essential. Cellu-Craft was a small company which could not afford technical men in the beginning, and Mr. Leeds did not know what he would have done to get the technical help needed to solve its original problems (22).

Cellu-Craft became a du Pont promotional converter only in June 1946, and remained so until January 1, 1947, when all promotional converter contracts were cancelled (22, 116). The assistance which Cellu-Craft received from du Pont was given largely during the time when Cellu-Craft was not a promotional converter. The assistance has continued since Cellu-Craft ceased being a promotional converter at the end of 1946 (22-23).

During the time that Cellu-Craft was a regular converter, in 1941, it received an advertising allowance from du Pont of half the expense of Cellu-Craft advertising and stationery that featured the du Pont label, up to 2½% of purchases. The converter discount was then 7½% (24, 60-61, 101-102). A voucher dated January 5, 1942 shows that du Pont made a refund to Cellu-Craft of expenditures for

advertising (23-24). This document was marked Leeds Exhibit 1 (51). Cellu-Craft did not receive an advertising (10)
allowance while a promotional converter. On November 1, 1941, du Pont's advertising allowance was eliminated, the converter discount was changed to a straight 10%, and the cash discount of 2% or 1% was eliminated. The 10% discount continued until 1947 (100-103). In this connection, a letter from C. F. Brown of du Pont to Cellu-Craft, dated September 29, 1941, was marked Leeds Exhibit 2 (101).

Cellu-Craft has received no technical services or sales services from Sylvania, either before or after 1948 when Cellu-Craft became a regular purchaser of Sylvania cellophane (24, 98).

Cellu-Craft purchases glassine principally from Hamersly Manufacturing Company, Garfield, N. J.; Deerfield Glassine Co., Old Deerfield, Mass.; and Riegel Paper Company, Philadelphia, Pa. (24). Cellu-Craft buys aluminum foil only in laminated form from four or five companies whose names Mr. Leeds did not recall (24-25). Pliofilm is purchased from Goodyear, acetate from Celanese Corporation of America, polyethylene from du Pont and Chester Packaging Company, and vegetable parchment from Riegel Paper Company and Kalamazoo Vegetable Parchment Company (25).

None of these suppliers has given any sales or promotional assistance (26). Only Goodyear and Celanese have given Cellu-Craft technical assistance (25). The technical assistance furnished by Goodyear and Celanese does not compare with that given by du Pont. These companies have

(11)

only sent a man to Cellu-Craft to demonstrate how to best use the material and how to convert it (26).

Cellu-Craft's main selling points are quality, service, performance and dependability. The sales approach is identical for cellophane products and for those of other materials (27). Cellu-Craft's salesmen carry a full line of its converted wrapping materials, except for two men who confine themselves to combination bags for the textile industry (27-28, 87).

Currently, Cellu-Craft's principal competitors in selling converted flexible packaging materials are Milprint, Traver, Roto-lith and Crystal Tube (26, 85). Competition with other converters has been intense during periods of free material supply, when many converters approach Cellu-Craft customers with lower prices, but not during periods of shortage, when Cellu-Craft can maintain its price to make a fair profit (27, 86-87).

Cellu-Craft has encountered competition from Daniels, but this has decreased in the past two years, because Cellu-Craft took Daniels' customers on the basis of superior quality, especially in heat sealing and printing (26, 28, 85, 87). This was because Cellu-Craft made a better converted product and supplied a better base sheet of du Pont cellophane than Daniels' converted product of Sylvania film (87-88, 113). The wrapping of meat became an important out-

(12)

let for Cellu-Craft's products early in 1950, at which time Daniels was the most active cellophane converter in the meat field (28). Cellu-Craft and other converters took meat business from Daniels (88). The difference in the cello-

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phane itself was important to Cellu-Craft's success against Daniels (113).

The current price of du Pont cellophane is 55¢ per pound and those of Olin and Sylvania are 56¢ for MST 51 or a comparable type (29).

Cellu-Craft now receives a converter discount of 7% from du Pont and 5% from Sylvania and Olin (29, 96, 115). The du Pont converter discount has varied from time to time (29). As to any discount Cellu-Craft received from du Pont, a similar discount was offered at the same time by Sylvania (98-99).

Cellu-Craft's products are sold throughout the Midwest down to Texas and all of the East Coast, but not on the West Coast (29). Cellu-Craft does not sell on the West Coast because of freight and competitive factors, and the difficulty of handling film over long distances (30). Du Pont has never attempted to control the territory in which Cellu-Craft sells its products (30).

Cellu-Craft determines its own prices. Du Pont has never tried to tell Cellu-Craft what prices to charge for its products nor has du Pont ever discussed specific prices with Cellu-Craft (30).

Cellu-Craft sells converted flexible packaging materials (13)
other than cellophane because some are better for the customer's requirements, and from a competitive angle where a customer cannot afford cellophane, Cellu-Craft can offer a variety of materials that are a little lower in price. Cellu-Craft thus keeps flexible, so as not to turn down any order (30-31).

On a poundage basis and taking cellophane as 100%, Cellu-Craft's purchases of glassine are about 50%, Pliofilm

are about 18%, foil are about 18%, and vegetable parchment are about 10%. Purchases of polyethylene in the past have been low and it is not available today (62).

Diaphane is a type of glassine more transparent than ordinary glassines (31). Glassine provides visibility, but is not as clear as cellophane (109-110). Glassine is used as the window in business envelopes, and some glassines available now have sufficient transparency to be used where the product or printing is desired to be seen beyond the glassine (109).

Cellu-Craft sells converted cellophane and other converted flexible packaging materials in the same market to the same people through the same salesmen (31).

Cellu-Craft has often used cellophane to replace other flexible packaging materials (32). A large proportion of Cellu-Craft's business consists of displacement of other materials (34). The following are illustrative examples: Cellophane replaced diaphane glassine as a wrap for white bread at the Junge Bread Company of Joplin, Missouri. It (14).
was a more attractive package and increased sales (32, 89). Cellophane replaced waxed paper as a wrap for rye bread and pumpernickel at the Pechter Baking Company of New York City (32, 89). Candymasters Inc. used cellophane to replace glassine for wrapping its ten cent Wallnut Hill candy bar (32). The ten cent bar could absorb the additional cost of cellophane to gain sales appeal, whereas the earlier five cent bar could not and was wrapped in glassine (89, 90). Printed cellophane did the best job for that use, which was sales in canteen machines where attractiveness of the bar is very important (90). Kleinerts Rubber Com-

pany of New York used cellophne to replace white bond paper envelopes for the wrapping of shampoo shades (33). The package for shampoo shades had a glassine back and a cellophane front to keep the cost as close as possible to the paper package previously used (33). The cellophane in the new package was 90% overprinted which provided a better package design along with a degree of visibility (91, 109). The substitution of the cellophane-glassine combination package boosted the sale of these shades greatly (33). The increase was due to the overall design rather than any particular quality of cellophane (109).
(15)

The Celu-suede Corporation replaced its glassine wrap for plastic draperies with a cellophane wrap (33).

Cellophane has often been replaced by other materials. Foil replaced cellophane in part for overwrapping oleomargarine because there was not enough cellophane available to meet the requirements of the increased market for oleomargarine, and producers find foil serves the purpose better than cellophane (34, 91-92). Oleomargarine is wrapped in foil, cellophane and parchment (114). Foil and cellophane are both used as overwraps (114). Foil and parchment are both used for individual quarters (114).

Cellu-Craft originated a cellophane wrap for handkerchiefs for the Almark Handkerchief Company, which was replaced by glassine which was sufficiently transparent and cost less (34). In the wrapping of slippers the Roberta Roberts Company replaced cellophane with Pliofilm and polyethylene. The Marlene Sportswear Company of New York, Cellu-Craft's largest customer for combination bags with a cellophane front, replaced this bag with a vinyl-

glassine bag because of complaints that the cellophane tore (35).

(16)

There is little difference in the cost of converting and printing glassine and cellophane. Glassine, cellophane, foil and parchment run in Cellu-Craft's machines at the same speed, and Pliofilm more slowly (35-36, 77). Polyethylene converts into bags at the same or greater speed than cellophane, but prints more slowly (36, 78).

Conversion of acetate is difficult due to problems of static electricity (77). The problems differ in degree with the film of different acetate producers (111). Celanese film is the worst in this respect (111). There are many kinds of static eliminators available costing from 15¢ to $15,000, which all work the same (111).

Cellu-Craft uses printing machines, bag-making machines, slitting machines and sheeting machines (36). The slitting machines will slit any type of material. Different machines are required for making bags of polyethylene and of cellophane. Another type of machine is required for making glassine envelopes (37). The same printing presses are used for cellophane, glassine, Pliofilm, polyethylene, paper tissue, and all materials which are printed by Cellu-Craft (37).

(17)

The price of glassine is about one-half that of cellophane (37). The converting costs of glassine and cellophane are about the same (38). The price that Cellu-Craft's customers pay for converted glassine is about one-half what they pay for converted cellophane (38).

The higher price of converted cellophane has been an obstacle to its wider use (38-40). The development of the

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combination cellophane-glassine bag was an economy measure to get customers who could not afford an all-cellophane item (39-40). In the wrapping of bread, for example, another economy measure was Cellu-Craft's development of a narrow printed band to identify the product. Since the customer wanted only a narrow printed section, it was a great saving to print a narrow strip and then overwrap the product with unprinted roll cellophane. The printed strip would cost one dollar a pound and unprinted overwrap 55¢ a pound. A roll of one-inch wide printed cellophane would cost about three dollars instead of $50.00 for a 15-inch wide printed roll (40-41).

Converted Pliofilm is more expensive than converted cellophane. Cellu-Craft has been able to sell Pliofilm because it doesn't break as readily as cellophane and gives better moisture protection. A single thickness Pliofilm bag pro- (18)
vides the same strength and moisture protection as a double cellophane bag, which would cost about the same (41-42).

In Mr. Leeds' opinion, polyethylene has greater sales potential than Pliofilm or cellulose acetate (42, 92). Polyethylene is manufactured by du Pont and seven or eight other companies (92-93). Polyethylene first became commercially available after World War II. He believed it will penetrate every industry and every seller. Eventually all textiles will be wrapped in polyethylene, and it will also be used for the wrapping of textiles, food products and for industrial uses. It will penetrate all end uses in which cellophane now has a position (43). Mr. Leeds did not know what reception polyethylene has had in meat packaging for supermarkets (88).

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Cellu-Craft's cellophane purchases are approximately 95% moistureproof and 5% non-moistureproof (44). Most of the uses for which Cellu-Craft sells cellophane require a moistureproof sheet. Whether cellophane's position in packaging is dependent on its moisture protection varies with the industry being sold. Textiles use moistureproof cellophane not for that quality, but because the film shrinks (19)
less and is more durable than non-moistureproof cellophane (44).

Cellu-Craft uses some types of cellophane now that it did not use before World War II, and also uses the same types that it used then. A new type of cellophane was developed in 1947 or 1948 for the packaging of fresh meat (44-45).

Quality of du Pont cellophane today is superior to its quality in 1937 (45). Sylvania cellophane did not improve in quality between 1937 and the end of World War II, but there has been great improvement since World War II (45). Olin cellophane is equal to du Pont and in some instances superior (46). Mr. Leeds can distinguish Sylvania cellophane from du Pont or Olin, but cannot distinguish between du Pont and Olin. He can detect the difference between du Pont and Sylvania film by testing the consistency of the heat seal, the variation in the thickness of the sheet, and a tongue test (46).

Cellu-Craft designs packages and often presents the wrapped product to the customer to show him what can be done to increase his sales (47).

There has been a tremendous increase in packaging generally since the end of World War II, both in transparent

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(20)

and non-transparent materials. The greater part of this increase has been in consumer size packages. In no earlier period was there a comparable increase in packaging (47-48).

All packages, both transparent and non-transparent are designed to stimulate buying. Transparent materials have been used in a way that makes them opaque just to get the sheen of the transparent package (48). Foil, which is opaque, has done quite a job on consumer packages. It can be printed beautifully, and has great eye appeal (48). Diaphane also has a glossy finish. Some customers feel it is a very attractive package, though Mr. Leeds does not. A new heat sealing glassine is converted by Cellu-Craft with a varnish coating that gives it high luster and good sales appeal (49). Waxed paper has improved in glossiness by the addition of a varnish or lacquer (49).

Impulse buying is not confined to a fully transparent package but may refer to transparent sheeting. Impulse buying depends upon seeing the product. Opaque packages do this by a window (49-50). There are packaging applications where opacity is desirable (104).

(21)

On a nice looking product, a transparent wrapper adds to sales appeal and offers protection without any printing. Visibility was not the main consideration in the wrapping of the shampoo shades. It was the design in printing and the method of display that made the difference, and it could have been done with glassine (94). Glassine has visibility, though less transparent than cellophane. Some glassine manufacturers such as Riegel claim 97% transparency for for their product (94, 95). Mr. Leeds did not know what

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percentage of glassine manufactured is highly transparent (96).

Flexible packaging is a part of the general packaging industry, and is a different part than rigid packaging (50). The materials encompassed in the flexible packaging industry in general serve the same markets and the same customers (50-51). Cellophane, glassine, waxed paper, Pliofilm, acetate, parchment and polyethylene are included in these flexible packaging materials (51, 115).

Cellu-Craft was classed as a fabricator of cellophane during 1938 and 1939, and did not become a converter until the early 1940's. Mr. Leeds believed the fabricator agreement between Cellu-Craft and du Pont provided that if Cellu-Craft reached a certain volume it would receive a (22).
refund starting at about 2½% for the first $10,000 of business on an annual basis (52-53). Cellu-Craft as a fabricator did the same type of work on the same material as it did later as a converter, except that the operations were done by hand (53-54). When Cellu-Craft became a machine-operated plant, it became a converter and received a converter's discount, which at that time was 10% (54). Mr. Leeds did not know whether the only difference between fabricator and converter was hand or machine operation. He got a converter contract when he approached du Pont with a new idea for the greeting card industry (54-55).

Mr. Leeds did not know how high the discount for fabricators went but did recall that Cellu-Craft reached only 2½% before it became a converter. The 10% converter discount was an advantage to Cellu-Craft (55).

In 1939 fabricators received a straight 3% discount instead of a progressive quantity discount (56).

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The terms of the promotional converter contract, which Cellu-Craft entered into in 1946, seemed to Mr. Leeds to be about the same as the regular converter agreement in effect from 1941 to 1946 (56). The only difference was that it gave Cellu-Craft more prestige in the industry to be recognized as a du Pont promotional converter. The dis-
(23)
count was the same in dollars and cents, and there wasn't much advantage to du Pont. The prestige helped Cellu-Craft in its approach to large users of cellophane (56-57). Mr. Leeds thought there were about seven or eight promotional converters, but did not know how many promotional converters there were (57, 99). Cellu-Craft's prestige was not lost when in 1947 all promotional converter contracts were cancelled (99, 116).

The promotional converter contract provided that the converter had to buy his requirements of cellophane from du Pont (58, 117).

Cellu-Craft uses Pliofilm to package dried fruits, blouses, shirts and slippers (64). Pliofilm's greater tear resistance gives it an advantage over cellophane in the textile field. Pliofilm is superior to cellophane for packaging dates, figs, and other food products because of its better moistureproofness and heat sealing properties (65). Pliofilm is not as transparent as cellophane, in Mr. Leeds' opinion, and has a tendency to collect dust (65-66).

The purpose of Cellu-Craft's economy combination bag is to reduce the cost of transparent packaging (66). The cellophane half of the combination cellophane-glassine bag is to give full transparency to the front of the package
(24)
(66). The glassine is used for enocomy and in some in-

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stances to hide the back of the garment (66). The glassine used by Cellu-Craft in this combination bag is relatively opaque for this purpose (66-67). A glassine front of high transparency would not serve as well as cellophane, although there are many glassine bags being used today for that purpose where users do not think 100% transparency is worth the cost (67). An all glassine bag costs 30% less than a combination cellophane-glassine bag (67).

Cellu-Craft produces different combination glassine backed bags with fronts of Pliofilm, acetate and glassine, as well as cellophane (103). All these bags are sold to the same trade (104). Those who object to tearing of cellophane use Pliofilm and pay a little more; those who don't want as much transparency use something else (118). Each type is sold for the particular need of a particular customer for a particular use (119). However, each of the forty or fifty items packaged in combination bags is sometimes packaged in a bag with a Pliofilm front, sometimes in a bag with a cellophane front, sometimes in a bag with a glassine front, and sometimes in a bag with an acetate front (121).
(25)

Cellu-Craft tries to use the product best suited for the particular end use involved (83). For some uses cellophane is an ideal wrapper and for others it is not suited (83). No material occupies a use completely, but is more recommended for it. As to most uses, two or more materials are used, as in the case of the combination bag with a front made of any one of four or more materials (112-113). It is the exception when one material occupies an end use completely (113).

Du Pont has recommended particular types of cellophane for particular uses and has not recommended other types

for those uses (84). Cellu-Craft found that in some instances where du Pont recommended a type of film for a particular use, another type of material such as Pliofilm or acetate would be better suited for that use, and Cellu-Craft would recommend that material to the customer (85). (26)
Cellu-Craft recommends the material it thinks best suited for the customer's product (88).

Du Pont never objected to the sale by Cellu-Craft of counter rolls of cellophane (68, 104). At the time that Mr. Roache of the Department of Justice spoke to Mr. Leeds several years ago, he thought that the converter agreement restricted him from making counter size rolls. He felt certain people were concentrating on that item and that Cellu-Craft was not supposed to make it. Mr. Leeds did not recall whether this was in writing or not (68, 69, 105). When Cellu-Craft had a demand for counter size rolls, however, it made them and was never stopped or punished (69, 105). Cellu-Craft later stopped making these rolls because the (27)
competition became so keen that it was not a profitable item (69). Mr. Leeds had told Mr. Roache several years ago that Cellu-Craft was making these rolls (69).

In making counter size rolls, Cellu-Craft bought 20-inch wide rolls from du Pont, rewound them into 100-foot lengths, put them in packer boxes with a cutter edge, labeled them and sold them (105). These rolls are used for exactly the same purpose as the common household box of wax paper (104-105).

Cellu-Craft has on isolated occasions resold rolls of cellophane in the same form as purchased although the con-

verter agreement did not permit such sales (69-70, 106). These sales were made without profit solely to help customers of Cellu-Craft who were in immediate need of cellophane to wrap finished products (70, 106, 122). Mr. Leeds' understanding at the time was that a converter was not permitted to resell cellophane unconverted (117). Cellu-Craft does not act as jobber for any product whatever; never was and never wanted to be a jobber of cellophane (120). It never purchased cellophane from du Pont for the purpose of reselling without conversion, and at the time of purchase there was no way to predict the quantity of these isolated (28)
emergency sales (106). The resales made as favors amounted to no more than 1,000 pounds in any year (122).

Cellu-Craft is on allocation today, and the allocation is not sufficient for its requirements (70). In addition to the allocation, however, Cellu-Craft purchases material from its customers who have allocations but no use for the poundage (70). In recent months all the cellophane manufacturers have offered Cellu-Craft additional film (70-71). Cellu-Craft is using more cellophane now than in 1947. If Cellu-Craft were not using more than in 1947, it would have sufficient supply (107).

During the last ten years there have been periods of short supply of cellophane. Mr. Leeds recalled shortages in 1949 and 1950. There was sufficient supply in 1947 and 1948. Cellophane was in short supply during World War II (71).

Cellu-Craft has never purchased cellophane from any foreign producer. Cellu-Craft looked into the matter during times of shortage but never bought foreign cellophane.

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The price of foreign cellophane was about 50% above domestic cellophane and this was a factor in not purchasing foreign cellophane (72). No customer of Cellu-Craft ever requested Cellu-Craft to purchase foreign cellophane (72-73). Mr. Leeds knows of some cellophane users, such as National Biscuit Co. and possibly Sunshine Biscuit Co., (29)
who purchased foreign cellophane to meet their requirements during periods of shortage (73).

If domestic and foreign cellophane were available at the same price, Cellu-Craft would buy only domestic cellophane because of the distance the foreign shipments would have to travel under varying conditions and the lack of technical assistance (108-109).

At that time, during the shortage periods of the war years and in 1949 and 1950, other flexible packaging materials, including glassine, were also in short supply and were on allocation (73, 74, 107). Cellu-Craft has been able to purchase glassine only on allocation since 1949 (74, 107). Most flexible packaging materials were in short supply in 1951, but are not now (107). There is still a shortage of glassine today (74).

The fact that certain foil and glassine manufacturers do much of their own converting has no influence on Cellu-Craft's converting more cellophane than foil or glassine. Cellu-Craft sells a superior service, particularly in printing, so that it makes no difference whether these manufacturers convert or not (75-76).
(30)

Acetate has more visibility than cellophane, and Pliofilm has about 20% less (76-77). Glassine is obtainable in all

forms of transparency, but no type of glassine is equal to cellophane in transparency (77).

Cellophane's heat sealing properties are better than those of glassine (78). Ordinary acetate does not heat seal, though a heat sealing acetate has recently come out (78). Pliofilm and polyethylene have excellent heat sealing properties (79). Pliofilm can be sealed by the welding method, but that is not the only method of heat sealing Pliofilm (79).

The heat sealing of cellophane depends on the coating (110). Plain non-moistureproof cellophane is not heat sealing (110). Cellu-Craft has had difficulty printing cellophane when it started, but the smearing of the ink was later eliminated (110). Similar difficulties are being encountered now with printing polyethylene, which is in the development stage, but good progress is being made (110).

The laminated foil purchased by Cellu-Craft is about the same in price on a yield basis as cellophane. Cellu-Craft uses principally .0035 gauge foil, laminated to 15-pound waxed tissue (80-81).

(31)

The principal wrapper for greeting cards is a cellophane bag (81).

Acetate is used principally for combination bags where moistureproofness is not important. Acetate is used for tomato wraps (81). Acetate works well when laminated to another material; the static problem is eliminated (81-82).

There is little difference today between the characteristics and physical properties of du Pont and Sylvania cellophane, but Mr. Leeds still prefers du Pont or Olin film to Sylvania, and believed almost all converters would. He prefers Sylvania non-moistureproof cellophane to du Pont non-moistureproof cellophane (82)

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Cellu-Craft exports its products, principally combination bags for textiles to Puerto Rico, Cuba, Mexico and Canada (96-97). Cellu-Craft has not exported to Europe, because it never chose to and because it does not have a large organization (115). Du Pont has never tried to control Cellu-Craft's exports (115).

(1)

NARRATIVE SUMMARY OF DEPOSITION OF JOHN R. TINDAL

Taken January 24, 1952 at New York, N. Y.

John R. Tindal is Manager of Sales and Market Research for the Package Machinery Company of East Longmeadow, Mass. He resides in West Springfield, Mass. (2). Mr. Tindal has been with the Company since 1915, starting in the design of automatic wrapping machines and serving as Assistant to the Chief Engineer from 1917 until about 1934 (2, 3). Since 1934, his work in sales and market research has involved making surveys and recommendations on old and new types of packaging machinery. In this work, he has investigated and become familiar with packaging materials, and developments in packaging (3-4).

The Packaging Machinery Company was formed in 1913 by the consolidation of six or seven small packaging machinery companies, each of which made machines for a different type wrap (4-5). It is the largest manufacturer of packaging machinery, and was in 1928 and 1930 (7).

The Company produces approximately 100 types of packaging machines (5). Approximately 80 of these types are designed to handle flexible wrapping materials, and the balance have been developed within the last two or three years to handle cardboard cartons (7-8). The machines wrap as tightly as practicable. This is not to be confused with the trade term "tight wrap" which is a technical desig-
(2)
nation for a wrap that is glued all over to an inner wrapping, as in a cereal package (5-6).

Moistureproof cellophane has not been tried as a "tight wrap" in the technical sense because of its shrinkage (60).

All of the Company's machinery is used for pre-packaging consumer goods, *i. e.*, packages in individual units for retail sales (8, 86-87). Some machines do bundling, which is collecting six or twelve packages and overwrapping the lot, but these are still consumer packages (8).

Practically all the Company's machines that employ flexible wrapping materials are designed to use two or more such materials with no adjustment or minor adjustment (8-9). Before the introduction of cellophane to the United States, the Company's machines first handled plain papers (printed wrappers) and later wax paper and glassine (9). The machines that first handled non-moistureproof cellophane were not new machines but were of a standard type which had previously been used for other materials (10). There was practically no change needed on a machine which used glue for sealing to make it also handle plain cellophane, but cellophane was difficult to handle (10).

Cigarette companies were among the Package Machinery Company's customers in 1930, using glassine as an overwrap for cigarette packages (10). When moisture-

(3)

proof cellophane was adopted as the cigarette pack overwrap, Package Machinery Company adapted the old machines with little change other than the addition of heat. The change was not expensive and did not require much time (11). Re-developments and refinements came later, but the machine is basically the same (10-11, 58-59).

The same machine that is used for overwrapping cigarettes is used in other fields such as wrapping gum (59).

If the cigarette companies should want to switch to aluminum foil they would not need new machinery (59). The present cigarette wrapping machine could be used without additional attachments. Liggett & Myers Tobacco Company obtained machines from American Tobacco Company which were set up for glassine and changed them over to cellophane (59). They could use foil on any cellophane or glassine machine (59; 80-81).

Cigarette machines are heatsealing. They use a solvent to prevent wrinkling and to reduce the amount of heat necessary (75).

The Company's machines generally use cellophane in roll form. Nearly all the machines can be equipped with a sheet feed. A roll feed machine is faster because the wrapping material is in a better condition to resist warping when it is in roll form (11-12).

(4)

It is essential that the Company's packaging machines be able to use two or more flexible packaging materials (12). Because of the effect of a shortage of one material on a machine that could handle only one material, the machine must be able to handle glassine, Pliofilm, Saran or any other wrap in order to qualify as a standard stock machine (12). The machines are sold as adaptable to any material within certain limits (13). As a standard practice the machines will handle cellophane and various papers, but for certain films (Saran, Cry-O-Vac, polyethylene, vinyls) some additional adjustments are required (13). A machine that would not handle more than one material could be sold, but it is for the benefit of the Company and its customers to make a machine that will handle a number of materials (59-60).

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Practically all the Company's machines will handle any of the flexible materials. Sheet feed machines are an exception for they will not handle transparent materials in sheets and the user would have to obtain a roll feed attachment (54-55). The interchangeability of the machines is true of both old and new models. Machines originally built in 1907 will handle practically any flexible wrapping material (55).

An example of the use of two or more materials interchangeably on a packaging machine is the 5¢ Kleenex package. Cellophane or acetate or glassine may be used on the package put out by the International Cellucotton (5)
Products Company. The same machine could make the same package of wax paper or cellophane, or, with some change, of Pliofilm (19).

Mr. Tindal knew that his Company's customers do use its machines for two or more materials interchangeably, but did not know the frequency of this, for the machine can be set up for gluing and heatsealing both, and so set up will handle either papers or cellophane or acetate and some polyethylene. The Company sells machines to customers without knowing precisely what material they will use. For those sales it is essential that the machine be able to handle two or more materials. The customers generally specify a machine that will handle wax paper, cellophane and acetate, and the Machinery Company does not know which will be run (19-20).

All of the Company's packaging machines have stationary heating elements with thermostat controls, for heatsealing. To change the temperature of the elements, all that is necessary is to turn a small knob. It is like controlling the heat in a room with a thermostat (85-86).

Since 1933 the whole packaging industry has grown because of more individual packaging and wrapping, and quite a lot of it is going into transparent packaging (13). This is because of visibility; people see what they are buying (60). The trend is toward transparent materials which are now used to wrap a tremendous amount of products (86). In frozen foods, the trend is toward opaque materials, for wax paper gives better protection (86).
(6)

The development of automatic packaging machinery has been important in the growth of packaging. Automatic machinery has contributed to lowering cost, increasing speed, and improving sanitation (13-14). The speed of packaging machines has increased substantially, thereby lowering unit cost (14).

Cellophane, wax paper and glassine can be handled with the same ease on packaging machines. There was some trouble with feeding plain cellophane originally, but the Company had as much trouble with glassine in the beginning as it did with cellophane. The shrinkage problem in plain cellophane was met by wrapping it more loosely. From the machine standpoint, that was easy to do. If plain cellophane was wrapped too tightly, it would break or warp the package (14-15).

Moistureproof cellophane did not present the shrinkage problem as plain cellophane. The first problem with moistureproof cellophane was to find a suitable adhesive. The glues that worked satisfactorily on plain cellophane would crystallize when used with moistureproof cellophane (16). A solvent for use in sealing moistureproof cellophane was finally found (16).

Wax paper, foil, glassine, cellophane, Pliofilm, Saran and polyethylene have all been improved in ease of operation on packaging machinery during Mr. Tindal's 37 years of experience (16-17). Difficulties are encountered with each new material when it comes on the market because each has some peculiarities (17). By work and development, these difficulties are gradually reduced (17). The Company's experience with cellophane was no different from its experience with other materials in this respect (18). Difficulties with Pliofilm, for example, impeded sales for a time because the standard machines could not be set up readily to handle Pliofilm. With the present improved sealing methods, the machines can handle Pliofilm by adding an attachment to the standard machine (18).

(7)

The Company sells machines to manufacturers of packages for resale and to customers who package their own products. The bulk of the Company's sales is to the latter class of customers (18).

During the last two or three years, a number of packagers of frozen foods have changed the overwrap from glassine and cellophane to a new type wax paper with a polyethylene wax coating which has a better sealing quality than ordinary wax paper (20-21). The same packaging machines which were used for cellophane and glassine overwraps on frozen food packages now use wax paper (21-22).

When a machine is changed over from a run of wax paper to a run of moistureproof cellophane, the necessary adjustment involves only wiping off the wax and changing the thermostat setting (22). For continuous runs of wax

paper, it is necessary from time to time to clean the heating elements. This is equally true of any heatsealing material which is coated, including moistureproof cellophane and
(8)
glassine (22-23). Cleaning the heating elements is a normal part of operations with coated materials, whether or not there is a change of materials on the machine (23).

The Company started using plain cellophane on its standard machines without advice or information from du Pont (23-24).

Du Pont cooperated with Package Machinery Company beginning in the late 1920's in the attempt to find a suitable adhesive for moistureproof cellophane (24). One of Package Machinery Company's servicemen successfully tried methyl cellosolve, a paint solvent, on moistureproof cellophane (63). It was not patented (63). Du Pont has continued to work with Package Machinery Company since that time, in order to make the machines run efficiently with cellophane (25, 64). Du Pont has helped on the feeding mechanism and temperature controls, and also furnished information on the characteristics of the various types of film being developed (25-26). Package Machinery Company always had every type film du Pont brought out, and du Pont gave full particulars on them (26). Du Pont did much laboratory and testing on the best heat, time and pressure for sealing cellophane, and gave Package Machinery Company the results of their findings (62-63). The du Pont people who worked with Package Machinery Company were chemists, mechanical engineers and salesmen, includ-
(9)
ing Oliver Benz, Warren Beh, Ralph Russell, Nelson Allen,

Albert Allen, Lesure, Baldwin, Prindle, Ferrelly and Ruby (26, 65).

Du Pont personnel frequently visit Package Machinery Company's plant. They have the full run of the plant and make use of it (26-27). Package Machinery personnel visit the du Pont laboratories and may do so at any time (28). Du Pont's technical personnel have accompanied Package Machinery Company's servicemen on sales and service trips (27).

Package Machinery Company has not paid du Pont for technical service and du Pont has not paid for Package Machinery's development work (27-28). Du Pont's assistance has helped Package Machinery Company to improve its machines and to increase sales. Du Pont tests and experiments have been available to Package Machinery Company and have been helpful (28, 62-63). Du Pont's interest was to improve the operation and efficiency of the machines for running cellophane, and naturally du Pont was interested in du Pont film (64-65).

Although du Pont does not recommend one machine unless it is the only one suitable for a particular job, du Pont does advise a number of machinery companies that a certain cellophane user is interested in packaging machinery (28). Package Machinery Company similarly notifies du Pont and other companies of prospects who want a transparent material (29). Package Machinery Company furnishes pictures and technical data to du Pont salesmen who (10)
carry these materials regularly (29). Du Pont does not push Package Machinery Company's products in preference to others, nor has du Pont ever tried to restrict or control

the sale of machines on which du Pont has cooperated (29, 65).

Package Machinery Company has not had the contact with Sylvania that it has had with du Pont (30). Sylvania came into an established field after most of the developments were worked out. Du Pont did the pioneering work. Package Machinery Company does contact Sylvania regularly. Its men go into the Sylvania plant, and Sylvania keeps it informed on all materials (30). Only two or three persons have been contacted in Sylvania. Plant visits to Package Machinery Company by Sylvania men are infrequent. A Sylvania technical man visited Package Machinery's plant to learn about its equipment, but the visit was for his education. Sylvania has made no substantial technical suggestions (30-31).

Glassine producers have not worked at all with Package Machinery Company on the development of machines (32). Wax paper suppliers such as Marathon and Nashua have worked with the Company on machinery development, as have Reynolds Metals, Goodyear, Dow Chemical and Celanese Corporation. These companies have worked with Package Machinery Company almost as du Pont has in proportion to their volume of business, but their volume of business has been considerably less than that of du Pont (11)
(32-33). Goodyear, Dow and Celanese have tried to help in adapting existing machines. Some of these were early models, that now use paper and cellophane, but do not have crimpers and flexible heating as later models do (33-34).

The degree of transparency of a material has no effect on its ability to be used on a machine (34).

Package Machinery Company sells cardboard set-up machines to the same customers who buy flexible wrapping materials, and in that sense flexible packaging materials are not a separate field from rigid packaging materials (34). All packaging materials, including tin cans, cardboard boxes, cartons, wax paper and cellophane, are in Mr. Tindal's opinion in the same packaging market (66). Package Machinery Company is not in competition with American Can Company because they make entirely different types of packages and Package Machinery Company does not handle metals (92). Package Machinery Company does not compete with companies producing machinery for the manufacture of steel drums or wooden boxes (81).

Cutomers who use cellophane on the Company's machines are not a different market from those who use glassine or wax paper. They are frequently the same people, for example, the biscuit companies which use acetate, Saran, wax paper, glassine, Pliofilm and cellophane (34-35).

To change a machine to handle moistureproof cellophane after a run of non-moistureproof cellophane, it is only necessary to switch on the heaters. The adhesive apparatus may (12)
be left on (35). The only difference between the two is that heat is applied to moistureproof film, but not to non-moistureproof (35). It is necessary only to turn the heat on when changing from a run of uncoated glassine to moistureproof cellophane on the latest machine (35-36). In other words, plain cellophane or glassine or moistureproof cellophane can be handled on the same machine by the use of glue or heat and the machine will perform one or the other or both operations (36).

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For changing from glassine or plain cellophane to wax paper, Package Machinery Company would have the machine equipped with pre-heaters for high speeds. These extra heaters are a refinement that other machine companies do not bother with. Change of materials on the machine would involve only changing the degree of heat by turning switches or dials (36-37).

The same setting of the heaters, approximately 350°, will handle all heatsealing types of cellophane (37). Most of the transparent films, coated glassine and waxed paper run at about 350° to 400° (37-38).

With proper adjustment, the Company's machines will heatseal satisfactorily every flexible wrapping material that is capable of being heatsealed (73). The heatsealing range of cellophane is greater than that of Pliofilm or polyethylene (52). A wide range of temperature for satisfactory heatsealing of any material means only that it requires less precise temperature adjustment of the machine (73-74).
(13)

Package Machinery Company's competitors include Hayssen Manufacturing Company, Oliver, Scandia, Battle Creek and Globe (38).

Package Machinery Company's products are principally for overwrapping as distinguished from bag making and filling machinery (38-39).

The Company's machines that will use cellophane are more efficient than those that were produced in 1930. These improvements have improved the sales of all packaging materials which can be used on these machines, and have contributed to the lower cost of packaging (39-40). The improvements in efficiency apply to all types of glassine, and

to Sylvania cellophane as well as du Pont cellophane. Improvements to which du Pont has contributed have benefited Sylvania as well (40-41).

A new type of wrapping material that could not be used on automatic packaging machinery would not be a commercial success, and development of satisfactory machinery would be essential to such success (41, 68).

British and European packaging machines are of lighter construction than American machines, are lower in cost but not better in performance (42).

A caramel wrapping machine manufactured by Rose Machinery Company in England competes with a comparable machine, the Forgroves, which Package Machinery Company sells in the United States. Machines of United States design are built and sold in England when the demand (14)
is sufficient to justify the expense of tooling for production there. The machines of Package Machinery Company are shipped to 37 countries, including England and Europe. United States exports of wrapping machines are greater than imports (70-71). Forgrove Machinery Co., and Henckel Co. in Germany, have licensed Package Machinery under patents (88).

Pliofilm and acetate run at about the same speed on packaging machinery as cellophane. Saran runs a little more slowly because it shrinks when heated and must be handled carefully. Polyethylene also runs more slowly. It is not more expensive to run Pliofilm or acetate on packaging machinery than cellophane. Saran might require equipment for heat control costing $50 to $100, and after that was installed there would be no additional running expense (43-45).

Saran seals with a welding action whereas cellophane is sealed by the coating. The same sealing mechanism could seal both materials, though Saran and Pliofilm require closer heat control than cellophane (45). Heatsealing of acetate on packaging machinery is being developed (45, 46).

The difficulty with polyethylene is that the melting point and fusion point are so close that a small amount of excess heat will melt the material. The same is true of Pliofilm. For this reason, cellophane can be heatsealed more easily than Pliofilm, acetate, Saran and polyethylene (47, 51, 52). Any material that gets too hot deterioriates, including cello-
(15)
phane. Machines today seal Pliofilm satisfactorily (76).

The Hayssen machine, which has heating elements that move in and out, will handle Pliofilm, acetate, Saran, polyethylene and other materials with hardly any change (46). Package Machinery Company's Models FA, FF and U-4 are set up for glue sealing, heatsealing and solvent sealing. The FA has solvent parts on it to handle acetate and some of the other materials which might be solvent sealed (46). Package Machinery Company's existing machines have to be modified or adjusted to run polyethylene, but the new models will not (47). An attachment for handling polyethylene, acetate and Saran on existing machines would cost approximately $1,250 (72). On a new machine the cost is not known because experimental work has been postponed due to the shortage of polyethylene (72). The Company is experimenting at the Charms Candy Company with a machine that will handle polyethylene without adjustments, but it is not known when the development will be completed (72-73).

A few of the Company's machines print cellophane, for example, small Chiclet packages. In using printed cellophane the machines have an electric eye which makes it easier to use roll feeds. The electric eye does not require adjustment for opaque materials, and works equally well on them (48-49).

The three basic factors in heatsealing are temperature, time and pressure. Moistureproof cellophane meets these (16)
tests well (49). Non-moistureproof cellophane uses glue only and does not meet the heatsealing tests (49). The non-transparent wrappers coated with paraffin wax have lower fusing points than cellophane. Mr. Tindal did not know which wrapping materials use paraffin wax as distinguished from other kinds of wax, but knew that there are two significant temperatures in wax, those that melt at about 135° and others at about 175°. (50-51). For high speed packaging, the temperature of the heating elements of the machine must be set higher than the melting point of the material because they are in contact with it only a fraction of a second (50, 74). Any wax handles in exactly the same manner including cellophane coatings (51, 75-76).

Sylvania cellophane and cellophane of foreign manufacture handle without difficulty on Package Machinery Company's machines. All cellophane handles about the same (52-53). The Company has tested cellophane of French manufacture in its machines (77).

There is no suitable adhesive or solvent for polyethylene, which is strictly a heatsealing material, not solvent sealing or glue sealing (53, 77).

Package Machinery Company puts static eliminators on packaging machines that are to handle acetate, Pliofilm,

Saran or polyethylene. In some cases this is unnecessary, but it is done as a safeguard to eliminate the need for service later (53). Acetate is running on about half of (17)
the packaging machines without static eliminators (84-85). They cost from $75 to $500 (85). Some users put on home made static eliminators (85). Static eliminators are not necessary for cellophane, wax paper or glassine (53, 77).

There is no difference in speed in the handling of fibrous materials from non-fibrous materials. Packaging machines will run as fast with kraft paper, wax paper and glassine, as with cellophane, regardless of heat (55-56). The machine could be run as fast as it would go with proper temperature adjustment for the material (57).

Pliofilm and cellophane have differences in properties and end uses (57). For most of the uses of Pliofilm with which the witness is familiar, including the wrapping of meats and potato chips, cellophane is also used (79). For most uses of cellophane, Pliofilm is not used (89). Pliofilm is better adapted for hermetically sealed packages than cellophane (78, 80). Both are used for products containing much liquid, although Pliofilm is probably better (89). Pliofilm is used for wrapping spark plugs, and cellophane is not (78).

The type of wrapper for soap is entirely different from that for gum or cigars, which is why the Company has so many different types of machines to handle different types of products (57). It is not fair to say that for each product (18)
there is an ideal wrapper, since the Company's type FA machine, which constitutes 25% to 40% of its business, will

wrap various products in various wrappers, whichever the person using it desires (57-58).

Some thermoplastic glassines are tacky and cannot be handled on Package Machinery Company's machines, which has stationary heaters. They can be handled without trouble on the Hayssen machine which has heaters that move in and out (61-62).

Package Machinery Company has patents on its machinery which it licenses to others. It takes out patents so that it will not be prevented from using the subject matter of the patent. Package Machinery Company has licensed patents to Scandia and possibly Reddington, and has licenses from American Machine & Foundry (66-67).

The Simplex machine is not generally a competitor of Package Machinery's products because it is semi-automatic. Package Machinery recommends it for customers with low volume (67). Also, Simplex is a bag making machine, which is a type of machine Package Machinery Company does not make (90). The only bag forming machine made by Package Machinery Company is one that makes the bag, fills it, and closes it, and this is the only instance where it could be said to compete with the Simplex Company (90). The machines of both companies wrap the same products, and Package Machinery Company recommends the semi-automatic machines to customers whose production is insufficient to pay for higher cost equipment (90-91). Automatic machinery is necessary for mass produced goods (68).

(19)

Brown sulphate paper is used mostly on bundles, but not for wrapping consumer size packages, so far as machine use is concerned (67-69).

Polyethylene, Saran, Pliofilm, Cry-O-Vac and the vinyls are all strictly heatsealing and not solvent sealing or glue sealing (77).

In 1930 a smaller percentage of transparent films was used in automatic packaging than is the case today. The increase has been sharper since the end of World War II (82-83).

Package Machinery Company's volume was $1,000,000 to $2,000,000 just before World War II, and it is now $4,000,000 to $5,000,000. The growth of consumer unit packaging is closely related to the growth of the Company's business and a decline in consumer packaging would result in a decline in the Company's sales (83-84).

The trend is toward a standard type of machine which will seal by impulse, and will handle all the homogeneous materials, including acetate (84).

Vegetable parchment is usable on the Company's machines with adhesive sealing (87).

Bread wrapping machines are made by the Company, usable for both white and specialty breads. Most of the Company's customers use wax paper for wrapping white bread. Mr. Tindal did not know whether the purchasers of machines use wax paper for specialty breads because the machine is so set up that one material can be run behind (20)
the other, *i.e.*, one type of bread can be run through with cellophane, the next with wax paper (87).

Practically all cooked fruits and vegetables are packed in tin cans (91). These are an entirely different type of package from that made on Package Machinery Company's equipment (92). Fresh vegetables are wrapped in acetate

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(91). Dried fruits are wrapped in cellophane (91). Fresh potatoes are packaged in large paper bags, and in brown paper. These are all consumer items, for which equipment is available (92).

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(1)

NARRATIVE SUMMARY OF DEPOSITION OF FRANK WILCOX

Taken December 14, 1951 at Chicago, Ill.

Frank Wilcox of Chicago, Illinois is Assistant to the Director of Purchases of Kraft Foods Company, and appeared by subpoena. He has been in purchasing work for Kraft about twenty years, and has been connected with purchasing of packaging materials even longer. He acts in a consultative capacity on purchasing problems (2-4, 33, 71).

Kraft is a cheese producer (4), has been in the cheese business since 1904 and accounts for about 45% of the domestic cheese business (6). Kraft is an equally large factor in the caramel industry, having entered that business in 1936 (6). Other lines are: salad dressings, oleomargarine, and jellies (4). Varieties of cheese sold by Kraft are:

American
Pimento
Brick
Swiss
Limburger
Camembert
Philadelphia Cream
Roquefort (imported only)
Cheese Spreads
Link Cheese (4-5, 15).

Kraft uses foil, cellophane, Pliofilm, Saran and glassine for cheese, all as a wrapper. There are differences in the

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protective quality and eye appeal of the various materials, which are differences in degree (80-81). However, foil's
(2)
opacity and cellophane's transparency are different characteristics, rather than a difference in degree (91-92).

Kraft produces American cheese in forty-pound blocks, which are wrapped in Pliofilm, Saran or cellophane, in the order of importance. As yet, Kraft has not decided which of these wrappers to adopt for this type of cheese, though Pliofilm has protective properties for this purpose superior to cellophane. These wraps replace the paraffin coating, now abandoned (13-14, 35).

Pimento cheese is simply an American flavored with pimento, and is packaged the same way as American (16).

Kraft does not make, but imports Roquefort in a five pound stone, which is then divided up in wedges or triangles and wrapped mechanically in foil. The more obedient folding characteristics of foil provide a closer fit and make it superior to cellophane, paper, or any type of wrap for this type of cheese.

Natural Swiss cheese is both imported and made by Kraft in bulk, divided up into 2, 5 and 10 lb. pieces, and wrapped in a transparent, heat sealing cellophane wrap, in order to facilitate visual inspection, which is the normal
(3)
means of appraising Swiss cheese (11-12).

Process Swiss is poured as a hot mass into a carton lined with a specially coated opaque cellophane cheese wrap, the wrap is sealed over the cooling mass, and the package closed, all mechanically (12, 49-50). The speed is 40 to 50 a minute (50).

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The opaque coated cellophane cheese wrap for process cheese is made by Marathon Corp. (Parakote) and Milprint (12, 13, 21).

Philadelphia cream cheese is so susceptible of odors, deterioration, and flavor loss that Kraft wraps it in foil, which alone provides the necessary degree of protection. The Parakote wrapper was tried during the war unsuccessfully permitting air pockets around the cheese which encouraged mold (14, 17). Foil is used also for eye appeal and consumer identification (87-88). Kraft's promotion created the eye appeal of the wrap, by associating it with the quality of the product. Kraft created the demand, and a purchase of the cheese is different from a sale to a buyer who sees the product itself in a transparent wrap (92-93).

Process Limburger like process Swiss is poured as a hot mass into a Parakote-lined carton (14).

Natural Limburger employs a paper-lined lead foil (4)
direct wrap. Over this, part of the trade calls for a glassine overwrap and part for a cellophane overwrap, to satisfy different consumer preferences (15).

Kraft wraps Camembert in aluminum foil (15). The necessary curing process emits gases, which the tight seal of a cellophane wrap will not permit to escape. Cellophane will permit the concentration of moisture under the wrap, and the cheese will become runny and unsalable (17-18).

Cheese spreads, like process cheeses, are wrapped in Parakote. Link cheese is wrapped in cellophane (15).

The cheeses on which Parakote wraps are used are principally the hot mass process cheeses. Kraft originally wrapped process cheeses in tin foil, later in aluminum foil.

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Cellophane was adopted because: it permitted higher production speeds, it "filled out" more easily than foil with the shape of the hot mass, and permitted a tighter seal, thus preventing undesirable moisture loss (16-17).

Kraft uses "Parakote" wraps for protection rather than "eye appeal" (38).

Kraft uses transparent cellophane for wrapping slices and cuts of cheese, where transparency is desired, and where parchment, foil or glassine could be used but would not pro-
(5)
vide adequate display of the cheese (42-43). It markets two half-pound packages of the same process cheese, one an opaque carton and the other a cellophane wrapper (89).

Kraft's first caramel package was a row of six or seven caramels, not individually wrapped, which were supported by waxed paper board and divided by waxed paper liners, with the whole overwrapped with a transparent wrap applied by hand (7). The pressure of Kraft's rising volume of production and sale made it essential to wrap mechanically (7). Cellophane had greater strength than waxed paper to withstand high wrapping-machine speeds, and had more secure sealing properties so as to prevent the unfolding of the wrap (8-9). It also eliminated sticking of the wrap to the caramel (9-10). For these reasons Kraft now wraps the individual caramel in cellophane, and the principal package of these pieces is a cellophane bag, although the bar, overwrapped with label paper, is also used (8). Sales prove that consumer acceptance of cellophane-wrapped caramels has been built up (40). Caramels are wrapped at a speed of 300-400 a minute on a battery of English made machines which are the fastest Kraft knows (48).

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During the war individually wrapped caramels were sold in highly decorated opaque paper bags, which were retained for sometime after the war, since the paper resisted
(6)
breakage, which was a defect in cellophane. These paper bags had a cellophane window after the war. Today Kraft caramel bags are entirely cellophane (40-42).

Kraft has three different packages for its oleomargarine:

1. A "squeeze bag", sold as uncolored margarine, which can be colored by breaking a color capsule and kneading the bag. The strains to which this bag is subjected require a strong material and a strong seal. Cellophane would not suffice, and Pliofilm is used (19).

2. Flat "western style" one-pound rectangular package with a direct wrap of parchment. This is to meet Government specifications, and is not a commercial package (19).

3. The principal retail package is the quarter-pound bar wrapped in highly colored aluminum foil. These bars are sold in a window carton. The foil is used as a means of promotion (20) and eye appeal (87) and to satisfy a consumer preference for foil (20, 88). It has displaced parchment (20). Mr. Wilcox does not consider cellophane suitable as a direct wrap for oleomargarine (36).

Kraft uses about three million pounds of cellophane a year (21, 33). Less than 3% is bought directly from the manufacturer. This is unprinted, and is used for wrapping
(7)
caramels and bulk cheese. The remainder is bought from converters: Marathon and Milprint (21, 66). All cellophane used by Kraft is moistureproof (82).

Converted foil cheese wraps are purchased from Reynolds, Alcoa and Shellmar. Converted foil oleomargarine wraps are purchased from these three and from Milprint (22, 66).

Kraft buys Pliofilm directly from the manufacturer, Goodyear Tire & Rubber Co. (22, 25).

Kraft buys its small requirements of glassine wrappers from Milprint (22, 66).

Kraft buys parchment from Paterson Parchment Co., Kalamazoo Vegetable Parchment Co., and West Carleton Parchment Co. (22).

A converter, such as Milprint, who furnishes a number of packaging materials to Kraft, has a single salesman handle the Kraft account for all materials (85). These salesmen do not refer to the various materials as suitable, interchangeably, for all Kraft products. In the case of Kraft, however, the function of a salesman as to selection of materials is small, since Kraft habitually makes its own selection on orders of quite precise specifications, and purchases particular materials for particular uses, relying little (8)
upon salesmen of a supplier of materials (67-68).

The cost to Kraft of various wrapping materials is approximately as follows:

Cellophane	—	$.55 a pound unconverted. $.97 converted (23).
Aluminum Foil	—	$1.00 a pound, all converted (23-24).
Parchment	—	$.35 or $.36 a pound unconverted. Approximately twice that converted (24).

Pliofilm — $1.65 a pound unconverted for a special gauge prepared by Goodyear to Kraft's specifications. Standard gauge is cheaper (25).

Mr. Wilcox was unable to quote an accurate price for glassine or waxed paper (24-25).

The cost of a wrapping material is a secondary consideration to Kraft, their major concern being with protective properties, facility of machine operation, and appearance of the wrap (22-23).

When Kraft began using cellophane for individual piece-wrapping of caramels, Sylvania was its supplier (25). Demand for Kraft's caramels required accelerated production rates (27) to the point where they are now producing at a rate of three to four hundred per minute per machine (26, 48). Sylvania film would not stand that speed and still will not but will allow "popping" or unfolding, of the (9)
wrap (26, 29, 65, 86). Periodic testing of Sylvania film continues today at Kraft's Glen View laboratory (28-29).

Kraft sought a solution to this problem from du Pont, and du Pont after many attempts finally developed a type of film that would meet the requirements (27-28). Kraft has always been reluctant to switch suppliers unless a new source of supply or new material was an improvement over the old (29-31, 79), but is always on the lookout for something new and something better (34). In 1940, du Pont was the only adequate source of supply to provide the volume and kind of cellophane Kraft needed; Sylvania might have been able to produce the tonnage, but was not adequate because its film was not right (66).

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5847

This change from Sylvania to du Pont cellophane was gradual (28) between 1939 to 1941. (65, 68), after which du Pont film has been purchased exclusively (on direct purchases), and specified for all purchases from converters (26, 47, 52, 58). This has extended to all cellophane purchased by Kraft, not just for caramels (47, 52-53, 57). The greater part of cellophane for Kraft caramels now comes from converters (25-26). The only reason Kraft specifies du Pont film on its orders from converters is that Kraft believes it has superior quality (83). Kraft uses (10)
Sylvania cellophane only experimentally, and still keeps the door open to Sylvania (47). At the time of Kraft's change from Sylvania to du Pont cellophane, Mr. Wilcox duties, so far as wrapping caramels was concerned, were just the buying of the wrapping materials after specifications were supplied (78-79). Kraft's technical people decided du Pont film was better, and Mr. Wilcox acted on that advice (81). Kraft keeps alternative suppliers of packaging materials under review, and wants more than one source as a protection (79).

The exclusive use by Kraft of du Pont cellophane, wherever cellophane is used, is founded upon a preference for quality of du Pont film (52, 55, 65, 81, 83) confirmed by constant review and laboratory testing of packaging materials (28, 58, 79), although Mr. Wilcox himself was not sufficiently familiar with the tests to discern any difference between a "Parakote" cheese wrap made of du Pont film and one made of Sylvania film (57, 58). Kraft remains receptive to a new approach by a supplier who can meet Kraft's standards (29-31, 47, 79). Kraft has tested Olin

cellophane, and left the door open for them to bring in a film that will work, as Kraft welcomes another source of supply (65). Sylvania does not yet have a satisfactory film, so far as Kraft is concerned (86). Sylvania salesmen continue to call on Kraft, and Kraft continues to experiment with Sylvania film (89-90).
(11)

The qualities of cellophane for which it is used by Kraft are:

Moistureproofness (82)
Transparency (39-40, 43)
Facility of operation on machines (8-9, 82)

It is used for protection rather than for "eye appeal" for wrapping cheese (38, 39). The Parakote cheese wrap is opaque (39) and is usually hidden by an outer carton (38). "Eye appeal" is important in selling caramels, though the "eye appeal" is principally attributable to the caramel itself (37, 39). For this reason, Kraft uses cellophane as a wrap and a bag for caramels (39). Kraft regards cellophane as the best wrapper because of clarity in cases where transparency is desired (34-35). Cellophane has "eye appeal," but does not present a product with substantially more "eye appeal" than any other wrapper Kraft would use. An example of superior "eye appeal" was a varnished opaque paper cheese wrapper, which the company was eventually forced to replace with a wrapper which possessed greater facility of application on wrapping machines (37-38). Cheese cartons are designed to stimulate buying through "eye appeal" (86). An advantage of foil, where used, is its high degree of "eye appeal" (87). When Kraft

uses cellophane, the cellophane has peculiar characteristics that render it particularly adaptable for the job it is doing (12)
on the particular cheeses it wraps (36). Another example is the wrapping of caramels, where Kraft want to show the caramel (36-37).

Aluminum foil is used for "eye appeal" and consumer identification purposes on oleomargarine (20, 87) and cream cheese (87, 92) as well as for its tight folding and protective properties (14, 17). It will pass gases emitted from active cheeses, and is used on Camembert cheese for this reason (15). When Kraft uses foil, foil has peculiar characteristics that render it best adaptable (36).

Pliofilm has distinguishable protective properties superior to cellophane that make it more adaptable for the job to be done on particular cheeses, and is used as a cheese wrap for these characteristics rather than for transparency (35). For other uses, cellophane has characteristics that render it adaptable to the product that Pliofilm does not have, and to that extent, for a particular product, the two materials are not interchangeable (46). Because it imparts an odor to cheese, Pliofilm is used for protective packaging of cheeses that are to be put through an additional process (45-46).

Both du Pont and Sylvania offer technical services, *i. e.*, assistance at the plant to ensure successful operation of their (13)
film (29, 58-59), and du Pont offers and performs certain sales services in the form of impulse buying studies (60, 84) and merchandising ideas (32-33, 60). These services have value to Kraft, and similar sales services are not pro-

vided or offered by Sylvania (84). Du Pont men contributing along this line have been R. R. Smith, Robert Crowley and J. A. Schaeffer (31-33). If a company has something to sell, it is part of its sales program to promote it by offering different types of service free of charge to customers (62-63, 90-91). Graphic arts companies continually give Kraft technical service, but not so much from a promotional service standpoint (62-63).

Kraft formerly received graduated quantity discounts from du Pont and Sylvania, paid at the end of the year (63), but these have been discontinued (64).

During World War II, Kraft experienced a shortage of cellophane (69), but since 1946-1947 Kraft has been able to obtain all the cellophane it has needed (70-72). Mr. Wilcox was not aware of a cellophane shortage in the last five years (71-72, 74).

Mr. Wilcox was aware of a current shortage of aluminum foil (85), and shortages of parchment, Kraft paper, and glassine during World War II (85).

(14)

Mr. Wilcox endorsed the statements made in Defendant's Exhibit 429, a du Pont salesman's trade report (75-76). The necessity for adjusting caramel wrapping machines when changing from cellophane of one producer to that of another was not a reason Kraft obtained du Pont cellophane exclusively for caramel wrapping (75). Periodic adjustments are necessary when running only du Pont cellophane (86). Mr. Wilcox said he would not "put too much stock in" some statements set forth in Defendant's Exhibit 428, another du Pont salesman's trade report. The salesman in Defendant's Exhibit 428 reports statements by

Mr. Bell, the supervisor of the caramel department, that du Pont cellophane was not as soft as Sylvania, but the machines were adjusted for du Pont film, and that Bell had recommended use of 100% du Pont because changing back and forth on source of supply would upset production efficiency (76-78). Softness of cellophane is a factor in wrapping caramels (74), and Sylvania film may have been softer at that specific time in 1940 (76-77). Mr. Bell was closer to the caramel situation than Mr. Wilcox (77).

Du Pont cellophane has improved in quality since its adoption by Kraft, owing in part to the demands of Kraft and the standards set by Kraft for a wrapping material (88).

(1)

NARRATIVE SUMMARY OF DEPOSITION OF E. E. ELLIES

Taken February 11, 1952 at Pittsburgh, Pa.

E. E. Ellies has been Manager of Films & Flooring Division of Goodyear Tire & Rubber Company (Goodyear) since May, 1950 (2). From 1945 to 1950 he was Assistant General Manager of the General Products Division, which included the Pliofilm Department. Prior to 1945 he had no dealings with Pliofilm (37). Mr. Ellies has primary responsibility for Pliofilm so far as Goodyear is concerned, and Pliofilm's principal development has been since he took charge of it. He had familiarized himself in a general way with the commercial and technical problems involved, but not with the background of basic patents, etc. (72). His offices are in Akron, Ohio, and his home in Clinton, Ohio. He testified pursuant to subpoena (2).

The only film manufactured by Goodyear for packaging is a rubber hydrochloride film for which Goodyear's registered trademark is "Pliofilm" (2-3). Goodyear uses vinyl films as packaging materials only in the form of a light weight disposable wrap for raincoats. Other manufacturers, however, have used vinyl film for packaging (67).

"Defendant's Ellies Exhibit No. 1" is a copy of a letter of inquiry received by Goodyear from the Department of Justice dated August 2, 1951, as to production, uses, etc. (2)
of Pliofilm (3). "Defendant's Ellies Exhibits No. 2" and "No. 3" are Goodyear's replies to the Government inquiry dated August 16, 1951 and August 30, 1951, respectively. Mr. Ellies was familiar with the answers in the Goodyear

Pliofilm is or has been used for the following end uses: Poultry, frozen foods, nuts, cigars and smoking tobacco, textiles and hose, primarily heavier textile packages such as sheets and pillow cases, paper products, drugs and medical supplies, specialty packages of cosmetics, hygroscopic materials other than cosmetic powders, coffee, cheese, snacks (9-11, 67-68).

Pliofilm has some flexible packaging uses where cellophane has not performed satisfactorily to date, but Mr. Ellies could not say whether cellophane development will proceed to where it is competitive in those fields later. Typical of such a field is the packaging of liquid products or those containing brine in the package. Cellophane to be used would be in the form of a lamination to a liner. Also cellophane has not participated in packaging dehydrated products, generally speaking. A number of applications of that type during the past five years have represented substantial volume, but in total would not be more than 50% of all Pliofilm business (49, 74-75). Another such use is Mil-O-Seal, which is Pliofilm formed into a tube that

(5)

is used for stuffing in a meat packing plant for boiled hams, meat loaves, etc. It competes with cellulose tubes for meat products, particularly the cellulose tubes of Visking Corporation (75).

Competition with other packaging materials is met primarily as follows: Aluminum foil in dehydrated products, dairy products and occasionally frozen foods; cellophane for most uses, one of the largest being self-service meats; cellulose acetate for fresh produce, paper products,

certain laminations and hosiery; Cry-O-Vac in heavy meats and poultry; greaseproof paper in non-horizontal competition by replacing the use of greaseproof paper in butcher service type of meat with the use of Pliofilm for self-service meats; glassine for box overwrapping, carton liners, bags for merchandising, and to some extent on nuts (11-13); polyethylene for frozen foods, heavy produce, case and drum liners, and textiles; Saran for dairy products and dried fruits; vegetable parchment for dairy products and produce; waxed paper for box overwrapping in baked goods and frozen foods; sulphite paper in paper products and textiles (13-15).

The end uses given in which competition is met are the primary ones. It would be impossible to give all the end uses for each product because in the packaging industry there are so many ramifications to packaging that no broad classification of material can be considered the answer to any general range of packaging problem. Every packaging problem is an engineering study in itself (14),
(6)

Since the introduction of Pliofilm, it has been improved both in characteristics and performance of the product itself and in its convertibility, which allows its use in high speed production. The growth of Pliofilm as a packaging material since World War II has been due to improvements in both these phases (15). Goodyear has increased the number of types of Pliofilm produced as a result of selecting packaging problems and designing wrapping material with characteristics to meet the problem. The development of a new type enables Goodyear to sell Pliofilm for a product where it could not previously be used (16). Pliofilm pro-

letters and the statements in them are true to the best of his knowledge (4-5).

Pliofilm was first sold commercially about 1937. It was not sold for civilian consumption during World War II (5). The general trend of production and sale of Pliofilm has been upward, although progress has gone by peaks and valleys. The greatest tonnage growth in Pliofilm has been since 1947 (5-6). The principal reasons for Pliofilm's growth in that period were that for the first time technical developments in the product enabled it to go ahead on a practical basis, and the exceptional rise in unit packaging of consumer goods since World War II (6-7). This expansion of packaging has applied to Pliofilm and other packaging materials (7).

Pliofilm is produced in two general groups, normal and plasticized, and there are subclassifications within each group. There may be as much range in variation among normal type films as there is between a normal film and a plasticized film. Each type is produced generally in different gauges (7-8). Principal differences between the groups are that normal films have a low rate of moisture vapor transfer and relatively low strength while the plasticized types have higher moisture vapor transmission and higher strength (8).

(3)

The type of Pliofilm known as 120-N-2 was a major type for the period 1938 through 1949 (8). The most widely used and important gauges of Pliofilm for flexible packaging are the 120 gauge and the 80 gauge. Generally speaking, these gauges have different uses. However, in produce, for example, 80 gauge may be used to package

units up to 2 or 3 pounds, and 120 gauge for sizes from 4 to 7 pounds. These gauges represent ⅔ to ¾ of total Pliofilm sales (51-52). The great bulk of Pliofilm sales are in 120 gauge or lighter (72-73).

Since World War II more than 90% of Goodyear's Pliofilm has gone into packaging (9, 48). Currently there are few uses for Pliofilm other than flexible wrapping. Prior to World War II it was used quite extensively in the textile field for such things as garment bags, rain coats, umbrellas, but that field has been principally taken over by the vinyl films. Pliofilm is used in very small quantities on products that require stitching (47-48).

Goodyear attempts to maintain records of poundage used for specific end uses which are, of course, subject to error in reporting from converters and users (9, 37-38). Goodyear insists that any customer purchasing material specify the products it is to be used upon. If Goodyear has tested material for that product and has a specification that tells a customer how to use it, it supplies the film. If it does not, it requests time to make tests to see if the film will perform satisfactorily and how it should be used, because (4)

Goodyear has a stake in the proper performance of Pliofilm (38). Goodyear attempts to keep commercial statistics on end use, but dealing through converters and distributors it is difficult for Goodyear to be positive that every end use tabulation it receives is accurate. Particularly during shortage, customers will sometimes misrepresent end use in order to get volume of material (38-39).

The most important end uses are in the perishable food lines, including, meat, fresh produce and dairy products (9).

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duced prior to 1950 was unsatisfactory for wrapping self-service meats. By designing an entirely new film and changing the casting technique, a type of Pliofilm was developed which enabled sales in the fresh meat market to the extent that this is now one of Pliofilm's most important markets (16-17).

Pliofilm has horizontal competition with cellophane in the self-service meat field in the sense that the two materials compete and the approach to the problem is essentially the same. Pliofilm also competes with greaseproof paper in the meat field, but in an entirely different way. The competition is in the complete change of the merchandising method from the butcher service type to self-service. Greaseproof paper would not be a satisfactory wrapper for self-service meat because the purchaser could not see the product. It would be satisfactory in the sense that it would perform a function, but customers would not want it that way and it would not be used (60-61). The competition between Pliofilm and greaseproof for self-service meats has (7)

the effect that where greaseproof paper was formerly used to package meats, it is not now used in markets that have adopted Pliofilm (77).

When the dried fruit business initially changed from cartons to transparent bags, primarily for self-service, cellophane was used. Later, because of its moisture control characteristics, Pliofilm took from cellophane a major share of that business. A still later cellophane development of a new type of coating enabled cellophane to recapture a portion of the business that had been in Pliofilm. Also, Saran is now a major competitor in the dried fruit industry (17).

In a packaging material that depends on its physical characteristics for performance, satisfactory development and research facilities are essential (18).

The ability of a material to be used on high speed machinery is essential to its modern use in packaging. In the early days there were problems in handling Pliofilm through printing equipment and also problems in developing inks that would work satisfactorily. These problems were solved to the degree that printing of Pliofilm is a generally developed art. They are not perfected, and Goodyear is never satisfied with the results (18).

Printing on Pliofilm varies with the formulation of the film. Mechanically speaking, the lighter the gauge the more difficult it is to handle. A good print job can be obtained on a light gauge of Pliofilm, and it does not smear (52-53) (8)

Goodyear attempted to sell Pliofilm as the wrapper for the common cigarette package. One attempt was made with a major cigarette manufacturer and one with a specialty cigarette manufacturer. Pliofilm performed satisfactorily, but there were questions in the convertibility problem and the resistance of the cigarette companies to any change in the appearance of their package. Since World War II, there has been a development program with another major cigarette company. Goodyear has not yet obtained any business other than a pilot plant type, but is not discouraged because it recognizes this is a long term program (19-20). Although cigarette companies are receptive to new ideas and improved packaging, they feel they must take extreme care in not making an abrupt change in the physical appearance of their package without a very careful study and a gradual

transition period. In that respect, they are more difficult to sell than the average end use customer (20). Pliofilm is sold today to tobacco companies for wrapping cigarettes only in experimental quantities, but the companies are starting to test it (65).

Pliofilm is not too moisture tight a wrap for tobacco (65-66). Part of the experimental work on cigarettes covers the problem of packaging for vending machines, including the insertion of loose coins in the package after it leaves the plant. The tests have not disclosed a tendency of Pliofilm to soften and get sticky from the heat from the light bulb in vending machines (66). The cigarette companies have been running tests on Pliofilm, and Goodyear has been working with them to correct the problems (66). (9)

In their resistance to changing the cigarette package, the tobacco companies class a number of things as changes not only in appearance, but in make-up of the package. One is in the location of the tear tape. Another is the possibility that other components within the package might be removed if Pliofilm were used. The cigarette companies are very careful in the approach to a change in the appearance of their package (68-69).

A package of cigarettes ordinarily includes foil, a paper liner, sulphite paper and cellophane. Sulphite and cellophane are both used on the same article probably for the same reason that two plies of sulphite paper are used, but Mr. Ellies was unable to say why this was (69).

If the cigarette companies go to a different construction for their package, since they sell their package on a national distribution basis and advertise it as such, if there is

any obvious change in appearance of the package they would have to make a complete changeover once they have completed regional testing periods. A switch to Pliofilm might or might not make a definite change in the appearance of the cigarette package; the Pliofilm package has not yet been developed (70).

In selling Pliofilm particular markets are selected. Pliofilm is in the higher price level of packaging materials and must be sold on the basis of performance. Goodyear has selected primarily the most critical food products which are susceptive to food spoilage, such as meat products and dried fruits (20-21).

In determining an end use toward which sales efforts (10)
will be directed, Goodyear selects any field that requires consumer packaging that is not then packaged, or any field where packaging is used but the packaging does not appear to be satisfactory. From either field the problem is selected depending upon potential business involved and how close Pliofilm is to the solution of the problem. Potential business is determined by market research studies (21). Pliofilm has low moisture vapor transfer, relatively high strength and toughness, good heat sealability, good dimensional stability, and transparency. These characteristics describe Pliofilm for packaging. The points selected in selling it depend entirely on the application. For example, coffee requires moisture control and gas permeability, and Pliofilm fits those requirements almost perfectly (22).

In promoting Pliofilm, Goodyear advertises in trade papers that reach the producer level, and, since it attacked problems in retail food selling, has advertised in trade papers that reach retailers. There has been some direct con-

sumer advertising. Salesmen go out with the product. Market surveys are used in selling to show a prospective customer what a Pliofilm package can do for his product and his sales, and also to show acceptance of a package after it is in use (23).

When Goodyear starts to sell a new end use, its salesmen start to work on producers or users of the product. Goodyear also cooperates with its converters and tries to stimulate them to work on the same market. Goodyear salesmen work with converter salesmen in developing the (11)
market, carry samples of converted Pliofilm with them and refer customers to converters (79-80). Converters have made an important contribution to the development of Pliofilm sales for packaging without fabricating or printing has a much narrower range (81). Among the converters who engage in these activities with Pliofilm are Shellmar, Milprint and Dobeckmun (81).

Goodyear provides both chemical and mechanical technical services to its customers. It has chemists that spend almost their entire time working with end users on variations in Pliofilm to do the best job on particular products. It also has its own machine design men who work with customers in designing or adjusting machinery to handle Pliofilm with minimum waste and high production (23-24). The technical men also work with manufacturers of packaging machinery (24).

Goodyear slits mill rolls into finished width and also produces sheets, but does no fabricating, printing or lamination. It sells to converters, including Milprint, Shellmar, Dobeckmun, Kennedy Car Liner, Nashua, Standard Cap & Seal, Kellogg Container, and a number of smaller

converters who have built their business around Pliofilm, such as Denton Corporation and Pen-Mac-Nye (24-25).

Pliofilm is used for laminations as well as unsupported, and is sold by the same salesmen for lamination as for unsupported use. As far as Goodyear is concerned, sales for lamination are no different from any other sales (25). Pliofilm used in laminations is generally less than 25% of total sales (53).

(12)

Goodyear advertises in the Modern Packaging magazine. It also insists that all its field salesmen subscribe to it and read it to keep up to date on what is going on in packaging. Goodyear also consults trade publications applicable to the major fields it is working on (25-26).

Pliofilm at times displaces another material to some extent for a given end use. When another product develops a major market for which Pliofilm might be used, Goodyear attempts to get part of that business. In other situations a major change in the packaging problem sometimes allows Pliofilm to replace a radically different material. An example of this is the Pliofilm package for liquids which replaces glass jars and cans. As to end uses that Pliofilm has penetrated, the normal situation is that Pliofilm gets some accounts but not all accounts. Mr. Ellies could think of no situation in which Pliofilm completely displaced all other flexible packaging materials (26-27). Pliofilm attempts to encroach on fields that others develop, and whenever it develops a field of any importance other materials attempt to replace it for part of the business. The normal situation is that two or more flexible packaging materials are being sold to customers for each end use (27, 75).

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~~D.X. 1014~~

The demand for Pliofilm was greater than the supply from the shutdown at the start of World War II until about the end of 1945, and again from the middle of 1950 through the third quarter of 1951. There have also been shortages due to the seasonal October peak in sales (28). In Mr. Ellies' opinion, the two major shortage periods were due (13).
to anticipated shortages when customers attempted to get well supplied with packaging materials, and also during both periods the basic raw material, natural rubber, was in short supply. These shortages occurred, although since 1945 the production of Pliofilm has been increasing (29). During both of these shortage periods, particularly the last one, practically all packaging materials, flexible and non-flexible, were in short supply, or in great demand. Currently, the market for packaging materials is one of recovery from over-inventories brought on by a period of frantic demand and some attempts at control that were not very well handled (29).

Cellophane was reputed in short supply immediately after World War II, and in a recent period (53). In the first period the cellophane shortage did not particularly affect the volume of Pliofilm sales because there were so many problems of getting back into production to supply even the original demand because of material difficulties that cellophane shortage didn't particularly affect sales or production of Pliofilm, although possibly it affected the apparent demand. In the more recent period with all packaging materials in short supply, there was some increase of demand for Pliofilm as a result of the apparent shortage of cellophane just as there was an increase of demand for

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Pliofilm as a result of the shortage of tin cans. Mr. Ellies felt that Pliofilm is in competition with tin cans and glass jars (53-54). When asked how he could figure a particular market for competitive purposes, if Pliofilm was in competition with tin cans, glass jars, waxed paper or transparent films, he used as an example the packaging of coffee. (14)

Coffee packages run the range of plain paper unlined bags, paper bags lined with glassine, paper bags lined with Pliofilm, glass sealed jars and vacuum packed tins. The packages have shelf life in approximately that order. Depending on the distribution problem and the quality or price level of the product, Pliofilm may be in the coffee business at intermediate level in normal times; when everything is very competitive it may lose part of that business to the cheaper lined bags; when glass or tin are short or prices are high and producers can get a higher price return on coffee, Pliofilm may take a sizable portion of the business away for a period from the higher cost packages. This is not defining a coffee market for competitive purposes, but a product is mentioned because every packaging problem must be designed around the product (54-56).

Products packaged in Pliofilm appeal to the eye, and that appeal is one type of sales appeal. In selling Pliofilm attractiveness is one of the points made. Market surveys show that packaging with Pliofilm stimulates sales (30).

The packaging market is an open market for all types of packaging material. There may be a few isolated applications where this is not true. The competition that Pliofilm encounters is currently largely from flexible materials, but there are many fields in which it hopes to compete that are presently in the hands of non-flexible materials (31).

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Competition in the flexible packaging industry is extremely keen. Goodyear believes that detailed sales statistics showing areas in which Pliofilm sales are concentrated, and particularly statistics that would indicate trends and changing concentration of promotion efforts, would be valuable to (15)
its competitors and prejudicial to its own competitive position (31-32).

Goodyear's interest lies in fields where its background gives it a maximum opportunity to do profitable business. Hence it has concentrated its efforts on two types of basic materials, rubber and vinyl copolymers. Up to late 1948, Goodyear had not seriously considered the manufacture of cellophane (33, 71). Du Pont offered about that time to license patents and technical information on cellophane, and invited Goodyear to look at the business. Several Goodyear people, including Mr. Ellies, had a discussion in Wilmington with the principals of the Film Division of du Pont (33, 71). Du Pont furnished statistics on capital investment required, estimated material and conversion costs, and the near range potential for transparent flexible packaging materials, to enable Goodyear to evaluate the proposition as a business enterprise. Goodyear made a cursory analysis of this, and arrived at the conclusion it could probably use its capital available for expansion to better advantage in the fields it had already selected. Goodyear's experience in packaging prior to the end of World War II had been rather sketchy and it was hesitant to embark too fast and too far until it was better grounded in packaging. It decided to put its capital and efforts in directions where the normal business risk was somewhat less, and if it wanted to go ahead in packaging it would eliminate one major variable by staying with raw

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materials with which it was familiar and which it knew how (16)
to process. The decision not to engage in cellophane manufacture was an independent decision of Goodyear, uninfluenced by du Pont (33-35).

The flexible packaging field generally is the major competition for Pliofilm. This includes specifically du Pont, Sylvania, Dow Chemical and the many people that are selling polyethylene or variations of vinylidene chlorides (35).

In the early days there was some difficulty with the odor of Pliofilm in food applications. This was never a serious technical problem, but the same type of problem that faces any new material that goes into an established market. It has been measurably improved. There was also difficulty with brittleness at low temperatures, which was the reason for developing the plasticized type of Pliofilm. These types are designed to retain strength at much lower temperatures, and are much better than the normal films at low temperatures (36).

Goodyear is not licensed to manufacture Pliofilm under a patent owned by somebody else (39-40).

On a yield basis, Pliofilm is much higher in price than waxed paper, glassine, sulphite paper and vegetable parchment (40). The price comparison between Pliofilm and aluminum foil, which is not transparent, depends on the gauge of each. Pliofilm is competitive in some respects and not in others (40). 120 gauge Pliofilm is approximately 30% higher on a yield basis than 300 MSAT cellophane, but due to general rubber conditions for the last year and a half, Pliofilm price is abnormally high due to abnormal increase in natural rubber costs (41). Generally speaking,

Pliofilm has always been higher priced than cellophane (41). Saran and Cry-O-Vac are in the same general price level as (17)

Pliofilm with some gauges slightly higher for a given application (41). Polyethylene and cellulose acetate, generally speaking, are lower in yield price than Pliofilm (41-42).

Gauge 40 Pliofilm is currently priced at about $1.50 a pound with a yield of 60,000 square inches. 80 gauge is $1.27 a pound with a yield of 31,000 square inches. 100 gauge is $1.27 a pound with a yield 25% less than 31,000 square inches. 120 gauge is $1.20 a pound with a yield of 21,000 square inches. 140 gauge is $1.20 a pound with a yield of 18,000 square inches. 235 gauge is around $1.35 or $1.40 a pound with a yield of 11,000 or 12,000 square inches. 250 gauge is in the same general price level as 235 gauge and the yield is in proportion. Business in this gauge is quite small (42-43).

Goodyear makes gauges of Pliofilm that are the same gauges as cellophane, and also makes considerably thinner gauges than are used generally in cellophane. One of Goodyear's competitive approaches because of the strength and toughness of Pliofilm is to attempt to do the same job with a lighter gauge than is possible with cellophane or some other flexible material. On the basis of equivalent gauges, Pliofilm price is approximately 50% higher than cellophane, but at the same time there are some applications in which a lighter gauge Pliofilm would be much closer to a direct yield competitive position with the cellophane that would satisfactorily do the same job (43-44). Thus far, Pliofilm's price has probably kept it out of some fields that cellophane is in (70-71).

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(18)

Pliofilm and waxed paper are general terms as far as moisture protection is concerned as there are many ranges of such protection in the different grades of each material. In competitive selling of Pliofilm against waxed paper, the primary points would not be moistureproofness per unit so much as the type of seal that could be obtained, transparency versus opaqueness, tear resistance and other characteristics (44-45).

When Goodyear tries to displace waxed paper as a packaging material with Pliofilm, the sales argument depends on the specific problem. In the case of a carton overwrap, the principal argument might be transparency through to a printed carton which might be a less expensive way of providing the printing, the strength of the wrapping material and the dimensional stability of the material under various humidities. The argument might or might not be increased moisture protection depending on how much wax was on the paper. Generally speaking, there is an intermediate step in such a change, possibly from waxed paper to glassine, before Pliofilm enters the competitive picture. Transparency would not be the principal argument in replacing wax paper, although it would be a main argument, but strength would also be a very substantial argument (59-60).

Sulphite paper is not nearly as moistureproof as waxed paper whereas glassine is intermediate between the two (45). Vegetable parchment is a specialty material with good wet strength and good grease resisting properties, but in general is not used in the same places as sulphite paper and waxed paper (45).

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(19)

Because there are so many variables, it is difficult to make a general answer as to the comparative protective qualities of cellophane and Pliofilm, except with respect to specific applications. One type of cellophane has good moisture retention properties in the same range as those of Pliofilm, but does not have the same type of dimensional stability or strength as Pliofilm, particularly at low temperatures (46). The moistureproof qualities of cellophane vary between the various types and the same thing is true of Pliofilm (73-74).

Relatively, Pliofilm does not have a tendency to collect dust, although possibly it has a greater tendency than some cellophanes, but less of a tendency than polyethylene. It does have a tendency to a fairly high degree of static electricity when being handled at high speed on automatic machines or printing presses (46).

From the standpoint of moisture protection, transparent films are in this order: cellulose acetate last, cellophane second, Pliofilm and polyethylene third, and Saran or the vinylidene chlorides best (47).

Pliofilm is not technically moisture vapor proof because materials packaged in it may very gradually change their moisture content. It resists moisture vapor transfer well, considerably better than the normal cellophanes, except a specialty cellophane like Saran coated cellophane. About the only materials that can be classed as moisture vapor proof are tin cans, a sealed glass container or laminates made into vacuum packages (50-51). Pliofilm's characteristic has brought it into a field that cellophane does not enter. Pliofilm is basically different from cellophane as

(20)

to its raw material components and some of its characteristics. In physical and chemical makeup, Pliofilm would be classed as basically different from cellophane (51).

Normal Pliofilm is distinguishable by a chemist from highly plasticized Pliofilm, but both are made from natural rubber as a base material and differ in the degree of plasticizer content and type of plasticizer. They are recommended for different end uses. 40 gauge Pliofilm and 250 gauge Pliofilm are distinct in appearance and in use. On the other hand on the basis of end use moistureproof cellophane and Pliofilm are not exclusive and distinct (76).

There is no difficulty with Pliofilm on machines due to non-uniformity of odor. There is difficulty on high speed machinery with static electricity unless static eliminators are placed on the machinery, but that is a relatively simple and inexpensive job (56). Whether separators are used between Pliofilm sheets with self-service meats depends on the customer, but this is not necessary for speed and efficiency. Goodyear does not recommend that Pliofilm be used in sheet form as it can be handled most efficiently direct from the roll (56-57).

Goodyear gives a discount on Pliofilm depending entirely on the way the film is ordered to match up web widths to make up a full mill roll. The discount is an enticement to eliminate waste (57).

Pliofilm is not as transparent as cellophane. Taking normal atmosphere as 1.00 the technical ratings of cello-

(21)

phane's transparency are .85 to .95 and the average normal Pliofilm's are five to ten points lower (57-58). Pliofilm

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~~D.X. 1014~~

does not get cloudy when stretched. If there is a tendency toward haze in Pliofilm, the tendency becomes more apparent in heavier gauges although the transmission of light is not actually impaired by the greater gauge (57-58). The dimensional stabiltiy of Pliofilm is not affected by exposure to direct sunlight (58). Pliofilm heatseals well, and it is not true that it has a narrow and low heatsealing range (58).

Cellophane, Pliofilm, acetate and Saran are transparent packaging materials (59). Transparent materials are different materials than opaque materials, and if a customer wants a transparent wrapper, he would not go to waxed paper or any other non-transparent medium (64). Transparent films can be a factor in impulse buying and so can a lot of other kinds of packaging (64). Opaque packages of good design can create impulse buying. Impulse buying is a function of the package regardless of the material. The term "impulse buying" is used loosely, but to a large extent it is a kind of self-service where the package must be the salesman (79). Pliofilm has lost customers to opaque material packages, but not generally speaking (79).

Flexible packaging materials are a part of the overall packaging market (64).

Although Pliofilm is not as transparent as cellophane, in some cases it is able to replace waxed paper and grease-
(22)
proof paper on the ground that it is transparent (61-62). Waxed paper and aluminum foil would be classed commercially as non-transparent. Vegetable parchment and sulphite paper would also be classified as non-transparent. As for glassine, certain types are used for merchandise

containers that are semi-transparent or in the twilight stage (61-62).

Mr. Ellies would not try to define the eye appeal of Pliofilm, for in the packaging industry the attempt is not to get eye appeal of the packaging medium. If eye appeal is defined as the ability to see the product through a transparent sheet that is glossy and has a certain amount of brilliance to it, it is not an asset in packaging some products, especially retail meat (63). There are some products where transparency is a definite advantage, but sparkle is not (63). Goodyear's approach to selling films for retail meats is that Pliofilm is very tough, does not have a high light reflection factor and will stretch tightly in contact with the meat, which permits customers to see the texture and bloom of the meat without reflection from a glossy material (63-64).

Reflection of highlights by the packaging medium is also a disadvantage to a certain extent in dried fruits. Sellers do not want dried fruit to look crisp and feel crisp, but want it to feel soft as having the moisture content the dried fruit should have. There are other possible applications where the characteristics of cellophane are not always the answer any more than the specific characteristics of Pliofilm are always the answer (82). Cellulose acetate also has sparkle (82). The Produce Department in a supermarket will dis-

(23)

close the same variation. On the green rack customers want crispness and sparkle that you get from acetate and cellophane, but in heavy materials like apples and oranges customers prefer a softer appearing package (82). Pliofilm in the normal types has a slight tendency toward sheen and sparkle and essentially no such tendency in the plasti-

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cized types. The type used on dried fruit does not have sheen. Pliofilm did not get into the market because of absence of sheen, however, but because of better moisture protection and because the Pliofilm package feels softer to the hand (86-87). Packagers of dried fruits don't look for highlights and cellophane has highlights (87).

Goodyear exports Pliofilm. On one occasion during a shortage, Pliofilm was imported from Canada. The imported film was more expensive and there was a duty on it (64-65).

Mr. Ellies could not without checking state any uses on which Pliofilm competes with non-moistureproof cellophane. One of Goodyear's prime reasons for having Pliofilm is that it is a highly moistureproof material (73).

The price spread between Pliofilm and other flexible packaging materials is of importance to Goodyear in planning its sales program and efforts. A reduction in the price spread between cellophane and Pliofilm would over a reasonably long period of time definitely affect Pliofilm sales. Similarly, a widening in spread between the two prices would affect Pliofilm sales (76-77).

Mr. Ellies could think of no instances in which Pliofilm (24)
is sold on the basis of transparency alone without any consideration of its protective qualities or its strength. Other transparent materials are available at less cost. Generally speaking, each sale requires a packaging engineering job and what a material provides depends upon what the problems are. The person selling the material must produce either a better package or as good a package at less cost, or he doesn't get the sale (77-78). When Pliofilm does not get

the business one of a number of people will do so. Sometimes these are people making flexible packaging materials and in other instances manufacturers of chip board boxes or other ramifications of the packaging field (78).

In the competition between flexible packaging materials each manufacturer puts emphasis on those qualities in his product that are most desirable for a given specific end use, and attempts not to stress those qualities in his product which are less desirable for that specific end use (82-83). In selling a packaging material the composite qualities of the material are what is sold. No one factor stands alone. Every packaging problem is analyzed with three major factors. One is the initial cost of the material, one is the intangible cost that goes into handling of the material or getting it around the article, and the third is performance. The weighted value of any one of the factors depends entirely upon the product to be packaged and what the requirements are for the package (88).
(25)

In packaging the person wrapping a product is looking for protection. Generally speaking, but not always, protection is the primary thing (84). Transparency is something in addition to protection and there are other things of importance beside those two. Much packaging is done to get a unit package where protection is not too essential and transparency is not a major factor. It may be an added incentive, but not the major factor (84). In perishable products and food items you sometimes have to have protection, but not always. In bakery products protection from the standpoint of cleaniness is a principal item. Transparency is an added quality on many applications. Waxed paper can give some

2343 5875

~~D.X. 1014~~

types of protection and is used in bakery products (84-85). Pliofilm has worked in the bakery field in a minor way, but has made no serious attempt to get into the field. It has not been aiming at any particular products, but if it makes an effort it will probably be in the field of crackers, cookies and bread (85-86). Crackers have a very low margin of profit and even cellophane is having a hard time getting into that field (86). Pliofilm's period in packaging really dates from World War II, and Goodyear has had plenty of things to keep busy getting Pliofilm developed properly and attacking fields that it believed needed a job done on packaging, and that is where it has put the bulk of its effort (86).

Pliofilm is used in packaging where the product is not visible and in those applications its transparency is unimportant (78).

(26)

Glassine is used for visible packaging in the sense it is used for over wraps on cartons where the printed carton shows through legibly, although not clearly. It is also used in bags for retail sale of textiles and peanuts (78-79).

Cellophane was once used as a wrap for pillow cases and sheets, but Pliofilm has been successful in penetrating that market (79-80).

Pliofilm has taken specific customers away from cellophane from time to time, cellophane has taken specific customers away from Pliofilm, and shift of accounts is a continuing process (80). There was no question in the witness' mind that Pliofilm is competing with cellophane (83).

There is no shortage today of cellophane or Pliofilm (83).

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Pliofilm is laminated to cellophane, to paper, to pulp, to foil and to Pliofilm. It is laminated to cellophane to get the peculiar characteristic that is needed in the combination between the characteristics of cellophane, the characteristics of the laminate and the characteristics of Pliofilm. Pliofilm has a characteristic cellophane does not have on the inside and cellophane has a characteristic Pliofilm does not have on the outside (83-84).

Manufacturers of transparent films are Goodyear's current principal competitors. It is difficult to put the competition from these films on a percentage basis, but it is more than half (87-88).

D.X. 1014-A

Defendant's Ellies Exhibit 1

DEPARTMENT OF JUSTICE

WASHINGTON, D. C.

HGM:MAH
60-32-13

August 2, 1951

Goodyear Tire & Rubber Co.
1144 E Market Street
Akron 16, Ohio

Re: United States v. E. I. du Pont de Nemours and Company, Civil Action No. 1216 (Delaware)

Gentlemen:

Certain issues raised by the defendant during the course of the subject litigation, which is now pending in the United States District Court at Wilmington, Delaware, are concerned with products of the type manufactured by your company. Whereas the Government strenuously contends that facts pertaining to the materials manufactured by your company have no place in the trial of an issue confined to monopolization of the cellophane industry, nevertheless it may become necessary to meet the defendant's position. Consequently, it is essential for the Government to ascertain certain facts relative to the production, use and sale of these products. It is probably desirable for all concerned that this end be accomplished by means of your voluntary cooperation.

There is attached a series of inquiries, answers to which will immeasurably assist the Government's presentation.

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Some may be answered directly, upon recourse to your books and records; others either call for or are more easily answered by submittal of documents contained in your files. It is requested that your company supply the information and documents sought by the interrogatories contained in the annexed list, to the extent that they are applicable to its operations. Copies, in lieu of original documents, and summary statements or schedules in lieu of original accounting records will be adequate.

If you desire oral explanation of any items included in this request, Mr. Julius C. Renninger of my staff will be available in Washington to confer with your representatives in person or by telephone.

Due to the shortness of time before the resumption of trial in the above entitled case your prompt cooperation will be appreciated.

Sincerely yours,

H. G. MORISON
Assistant Attorney General

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D.X. 1014-B

Defendant's Ellies Exhibit 2

THE GOODYEAR TIRE & RUBBER COMPANY

August 16, 1951

The Attorney General
Department of Justice
Washington, D. C.

Re: United States v. E.I. DuPont de Nemours and Company, Civil Action No. 1216 (Delaware)—Reference: Letter of August 2, 1951—HGM:MAH 60-32-13

Dear Sir:

We have your letter of August 2, 1951 requesting for purposes of the above litigation information on flexible packaging materials as outlined in a schedule of items which is attached to your letter.

Upon analysis of the information requested by you, we immediately encountered a serious problem of disclosure. A substantial part of the information requested is in the nature of confidential trade secrets. The flexible packaging industry is still growing rapidly and competition therein is extremely keen, particularly with regard to the development of new applications and new markets. Detailed sales statistics, whether in units or dollars, showing the areas in which our sales are concentrated, and particularly such statistics as would indicate trends and changing concentration of promotion efforts, would be extremely valuable to our competitors and correspondingly highly prejudicial to our own competitive position.

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We can readily appreciate the circumstances which prompt you to make your inquiry and we wish to assure you that our reluctance to disclose the requested data arises not from any inclination to obstruct but from the necessities of self-protection.

The following answers, numbered to correspond with the items enumerated in your schedule of "Information Requested", represent a genuine effort to furnish to you as much information as possible, consistent with proper observance of the best interests of this Company.

1 and 2. We manufacture and sell only categories "j. Vinyl Films" and "m. Pliofilm." With respect to our vinyl film, we believe that practically none of it is used for packaging or wrapping. Our rubber hydrochloride film, which we call "Pliofilm", on the other hand, is believed to be substantially all used as a flexible wrapping material. At the present time our rate of production of Pliofilm is between ten and fifteen million pounds per year. Although this rate of production exceeds the actual volume of production in any past year, we

(2)

are hopeful that it will continue or increase. During World War II, we produced relatively little Pliofilm because of the shortage of rubber, which is one of the basic raw materials of Pliofilm. In terms of dollars our present sales of Pliofilm are at a rate of approximately twelve to fourteen million dollars per year.

3. Assuming that the total overall sales volume of Goodyear for all products will be in the neighborhood of one

and take the product at their own risk (7). By 1937, foreign producers were offering moistureproof cellophane, but it was not much in use since it cost more and not very moistureproof (7-8). They offered only one type of moistureproof cellophane (10). The price of French and German cellophane then was 50% to 100% higher than the price of U. S. cellophane (15).

Prior to World War II, European cellophane producers could not have given price, quality and service that would have satisfied U. S. consumers. As late as 1950 BCL, La Cellophane, the Belgians and Germans were asking why U. S. cellophane was better, what should be done and how cellophane was packed. Mr. Goland told BCL how to pack cellophane and what kind of core to use for rolls. Foreign cores broke and were not strong like du Pont cores (38-39).

Mr. Goland was in Europe November, 1950-January, 1951 (39, 40). He got in touch with cellophane producers in England, France, Belgium, Germany, Italy and Spain (10-14). Two-thirds of European production is non-moistureproof (133), and the one-third moistureproof is not comparable to the various types produced in the United States for wrapping specific products. European producers do not offer a similar variety of types (8-9). They (3)
make only one type of moistureproof and one type of non-moistureproof (40-42). BCL and La Cellophane began manufacturing moistureproof cellophane soon after du Pont began making it (77). Kalle and perhaps Wolff now also make moistureproof film (130).

In 1951, European cellophane producers included: in England, BCL, the largest, and Transparent Paper, Ltd.,

billion dollars this year, the ratio of Pliofilm sales to total sales would be about 1½%.

4. Copies of published price lists and other material relating to Pliofilm, as requested, to the extent that they are available, are being collected and we expect to forward them to you very shortly.

5 and 6. As previously indicated, the areas of application of Pliofilm and the relative importance of such areas is extremely confidential information. Regardless of that consideration, we are further handicapped in answering these particular items by the fact that our information regarding the end use of Pliofilm sold by us is in large part hearsay. Subject to these limitations, we can nevertheless estimate with some confidence that of all the Pliofilm being sold by us from 25% to 30% is probably used in wrapping commodities enumerated in categories a. to t. of your item 5, and that no one such category probably accounts for more than 5% to 7% of that total. According to such information as we have, it is indicated that Pliofilm is not used at all in 5 of the 20 enumerated categories and only in very small quantities, possibly experimentally, in some 6 or 7 others. At this point we should perhaps point out again that identification of the specific categories to which we are referring would give aid and comfort to our competitors.

7. We have in preparation a statement of the principal physical characteristics of Pliofilm which we expect to forward in the near future, probably with the material mentioned under item 4 above.

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which also has a small plant in Canada; in France, La Cellophane, Dalle Freres, and La Cellulose de Conde; in Belgium, Sidac; in Germany, Kalle, Wolff, and a third company; in Switzerland, Feldsmuhle at Rorschach; in Italy, Snie Viscosa and two others; in Sweden, Svenska Rayon A/G, and Ellender; in Spain, two or three producers (10-13). The Spanish make only non-moistureproof film, and the Italians make 75% to 90% non-moistureproof (13-14).

Cellophane is still considered a luxury in Europe, and is used in most cases to wrap exports to the Western Hemisphere. It is used not at all or very seldom on low cost food items, such as breads, penny candies or cereals (14-15).

During his 1950-1951 trip to Europe, Mr. Goland tried unsuccessfully to purchase cellophane from Kalle, Wolff, La Cellophane, Italian, Swiss and Spanish producers, BCL, and all the European producers, none of whom would sell to him. Wolff needed the cellophane for its own use on a (4)

barter system, and asked a high price. La Cellophane said it was not interested in the American market and could not compete there because its price was higher and there was an American duty (36-37). The Swiss cellophane price was too high. An Italian company quoted $2 or $3 a pound. Spanish producers would not sell anything, and had only non-moistureproof (36-38).

The European concerns have never had an over-production of cellophane (103-104). As of 1950-1951, Europe had sufficient cellophane production to penetrate the United States market, but European producers do not analyze the market or try to improve their material. They seem to

We trust that the foregoing information will enable you to determine the position of Pliofilm in the packaging field relative to its competitors and to serve the essential purposes of your inquiry.

We should like to take this occasion to point out that the word "Pliofilm" is a registered trade-mark of The Goodyear Tire & Rubber Company, which is used by it on rubber hydrochloride films. You will readily appreciate the reasons for our requesting that in any further reference to Pliofilm you use the generic term "rubber hydrochloride films" with, if you wish, the word "Pliofilm" in parenthesis. Alternatively, it should be expressly indicated that the word "Pliofilm" is a trade-mark of The Goodyear Tire & Rubber Company.

Yours very truly,

R. Crafts Attorney
mr

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Defendant's Ellies Exhibit 3

THE GOODYEAR TIRE & RUBBER COMPANY

August 30, 1951

The Attorney General
Department of Justice
Washington, D. C.

Re: United States v. E.I. DuPont de Nemours and Company, Civil Action No. 1216 (Delaware) — Reference: Letter of August 2, 1951—HGM:MAH 60-32-13

Dear Sir:

Supplementing my letter of you of August 16, 1951 in response to your inquiry of August 2, 1951 under the above reference, there are enclosed herewith the following Pliofilm price lists:

1. Normal Pliofilm — November 1, 1939
2. Plasticized Pliofilm — November 1, 1939
3. P4 Plasticized Pliofilm — November 1, 1939
4. Normal Pliofilm — N0, N1, N2, CC, NID, P2H — June 10, 1947
5. Special Plasticized Pliofilm — P4A — P6A — June 10, 1947
6. Pliofilm — October 1, 1949
7. Pliofilm — June 15, 1950
8. Pliofilm — August 15, 1950

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9. Pliofilm — September 25, 1950, with covering letter dated September 18, 1950
10. Pliofilm — November 10, 1950, with covering letter dated November 6, 1950
11. Pliofilm — April 1, 1951, with covering letter dated April 17, 1951

These appear to be all of the Pliofilm price lists which were in effect during the period 1940 to date.

The terms of sale have consistently included a 2% discount for cash payment on or before the due date of invoices.

Effective July 1, 1948, there was instituted an annual incentive bonus for Pliofilm converters as set forth in the attached excerpt from the form of agreement with such customers, marked Exhibit A.

Beginning with 1951 the bonus provision has been embodied in a separate document, copy of which is attached, marked Exhibit B.

(2)

The provisions of the current form of agreement with converters concerning prices and terms are attached marked Exhibit C.

In the case of Pliofilm Distributors, an annual incentive bonus was first instituted for the period July 1, 1950 through December 31, 1951. A copy of the applicable provision of the form of agreement with such customers is attached marked Exhibit D.

In addition to the foregoing and the attached price lists, there is included herewith the statement of the principal

physical characteristics of Pliofilm requested by Item 7 of the schedule attached to your letter.

Very truly yours,

Attorney

R Crafts
bwg

~~D.X. 1014-C~~

EXHIBIT A

Excerpt from July 1948 Pliofilm Converter Agreement

4. PRICES

All sales will be made at Seller's current list prices in effect on the date of shipment. All prices are subject to change at any time, without notice, by the Seller.

To encourage extra selling effort on the part of the Buyer, the Buyer will be allowed an annual incentive bonus calculated on the aggregate purchases of the Buyer at the Seller's net invoice price of all merchandise billed by the Seller to the Buyer under this agreement as follows:

If Aggregate Exceeds In Pounds	Rate of Incentive Bonus
100,000	3%
250,000	4%
500,000	5%

With respect to the period commencing July 1, 1948 and ending December 31, 1948 the accrued incentive bonus will be calculated with proration of the required aggregate to correspond with the period covered. (Note: This paragraph was omitted after 1948.)

Such incentive bonus calculated on the basis of the effective rate on the cumulative net invoice value, with appropriate adjustment for retroactive accruals in the event of change in rate under the above schedule, shall be payable by merchandise credit memorandum on or before the 25th of the following month.

"Net invoice price" shall mean total merchandise billing less transportation tax, returned goods, and less all discounts except cash discount.

In case of cancellation of this agreement by the Seller, accrued incentive bonus will be calculated with proration on an elapsed time basis of the required aggregate.

(2)

5. TERMS

All invoices will be due on the 10th of the month following date of invoice, with a discount of 2% for payment on or before due date. Upon failure of the Buyer to make any payments when due, the Seller may, at its option, cancel this agreement or defer additional shipments until overdue accounts have been paid. The Seller may decline to make deliveries except for cash whenever it is not satisfied with the Buyer's financial responsibility.

EXHIBIT B

THE GOODYEAR TIRE & RUBBER COMPANY, INC.

INCENTIVE BONUS PLAN FOR PLIOFILM CONVERTERS FOR THE YEAR ENDING DECEMBER 31, 1951

Effective January 1, 1951

To encourage extra selling effort on the part of Goodyear Pliofilm converters, the converter will be allowed an incentive bonus terminable at any time at Goodyear's option, calculated on the basis of the aggregate of Goodyear's net invoice price of all Pliofilm billed by Goodyear to the converter during the period the converter holds a Pliofilm Converter Agreement and abides in all respects by the terms thereof as follows:

For Aggregate Purchases in Pounds	Rate of Incentive Bonus
Up to 250,000	3% (will be deducted from invoices)
250,000 to 500,000	4%
500,000 and over	5%

This incentive bonus applies excepting when otherwise announced in connection with particular sales and applies only when the converter energetically carries out its undertaking as provided in the Converter Agreement.

Such incentive bonus will be calculated on the basis of the effective rate on the cumulative net invoice value with appropriate adjustment for retroactive accruals in the event of a change in the rate under the above schedule. The bonus

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above 3% will be payable by merchandise credit memorandum on or before the 25th of the month following the end of each accounting period ending March 25, June 25, September 25, and December 31.

"Net invoice price" shall mean total merchandise billing less returned goods, and less all discounts except cash discount.

This plan is not a contract nor shall it in anywise affect the converters' contract. For violation of the letter or spirit of any of the conditions, The Goodyear Tire & Rubber Company, Inc, may, in its discretion and without notice, withdraw or modify this plan at any time, but will make equitable adjustment with converters who have fully complied with the conditions hereof for any transactions up to the date of such modification or withdrawal.

(2)

The above stated terms and conditions of this plan are not subject to change or modification in any manner except by written communication signed by an executive officer of The Goodyear Tire & Rubber Company, Inc.

Akron 16, Ohio, Dated January 1, 1951.

THE GOODYEAR TIRE & RUBBER COMPANY, INC.

EXHIBIT C

Excerpt from January 1951 Pliofilm Converter Agreement

4. PRICES

All shipments will be billed at Seller's current list prices in effect on the date of shipment less such discounts and allowances as the Seller may from time to time allow to its PLIOFILM converters and subject to the conditions set forth in such list. It is understood that such prices, discounts, allowances, and conditions are subject to change by the Seller from time to time without notice to the Buyer.

5. TERMS

All invoices will be due on the 10th of the month following date of invoice, with a discount of 2% for payment on or before due date. Upon failure of the Buyer to make any payments when due, the Seller may, at its option, cancel this agreement or defer additional shipments until overdue accounts have been paid. The Seller may decline to make deliveries except for cash whenever it is not satisfied with the Buyer's financial responsibility.

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EXHIBIT D

Excerpt from June 1950 Pliofilm Distributor Agreement

4. PRICES

All sales to the Distributor will be made at Goodyear's current prices designated as "Goodyear Prices" in effect on date of shipment by Goodyear. All prices are subject to change at any time without notice by Goodyear. In the event of any general reduction in such "Goodyear Prices," Goodyear will credit the Distributor's account in the amount of the reduction with respect to all stock shipments invoiced by Goodyear to the Distributor within 30 days prior to the effective date of the reduction.

To encourage extra selling effort on the part of the Distributor, the Distributor will be allowed an annual incentive bonus calculated on the aggregate purchases of the Distributor at Goodyear's net invoice price of all merchandise billed by Goodyear to the Distributor under this agreement as follows:

Yearly Aggregate in Pounds	Rate Incentive Bonus
under 250,000	3%
250,000 to 500,000	4%
500,000 and over	5%

With respect to the period commencing July 1, 1950 and ending December 31, 1950, the accrued incentive bonus will be calculated with proration of required aggregate to correspond with the period covered.

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Such incentive bonus in the brackets above 3% calculated on the basis of the effective rate on the cumulative net invoice value, with appropriate adjustment for retroactive accruals in the event of change in rate under the above schedule, shall be payable by merchandise credit memorandum on or before the 25th of the following month. Incentive bonus of 3% will be deducted from each invoice.

"Net invoice price" shall mean total merchandise billing less returned goods, and less all discounts except cash discount.

(2)

In case of cancellation of this agreement by Goodyear, accrued incentive bonus will be calculated with proration on an elapsed time basis of required aggregate.

5. TERMS

All invoices will be due on the 10th of the month following date of invoice, with a discount of 2% for payment on or before due date. Upon failure of the Distributor to make any payments when due, Goodyear may, at its option, cancel this agreement or defer additional shipments until overdue accounts have been paid. Goodyear may decline to make deliveries except for cash whenever it is not satisfied with the Distributor's financial responsibilty.

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The Principal Physical Characteristics of Pliofilm (Item 7)

The principal physical characteristics of Pliofilm are as follows:

a) Heat sealabilty—forms a welded seal which is as strong as the film.

b) Printability—may be printed on rotogravure, aniline, and letter presses with special inks.

c) Clarity—clear, 85% transmission compared with air.

d) Tear strength (Elmendorf or other test)—from 50 grams/mil to 1600 grams per mil.

e) Bursting strength—stretches to limit of machine.

f) Water absorption in 24 hours immersion—4.7%.

g) Moisture permeability—1.75 grams to 10.0 grams per mil depending upon type and gauge.

h) Permeability to gases—CO_2—180 cc per 100 sq. in. per 24 hrs. to 4800 cc per 100 sq. in. per 24 hrs. depending upon type and gauge.

i) Dimensional change with humidity difference—None.

j) Resistance to greases and oils—Good.

k) Wrapping machine running qualities—excellent—redesign of heat sealing parts necessary.

l) Odor yielding—slight order characteristic of rubber hydrochloride. By trade acceptance Pliofilm is odorless.

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D.X. 1015

(1)

NARRATIVE SUMMARY OF DEPOSITION OF MARC GOLAND

Taken January 22, 1952 at New York, N. Y.

MARC GOLAND, who resides at 601 W. 115th Street, New York, N. Y., is President of Printon Corp., (Printon), located at 304-310 E. 23rd Street, New York, N. Y. (2). Since January, 1950, he has legally changed his name from Marc Golandsky (24).

Mr. Goland was born in Latvia and educated at universities in East Prussia, Switzerland and Germany (2).

His father was in the printing business in Europe, printing on paper, cellulose nitrate and cellophane, even prior to 1916 (2-3).

Mr. Goland taught economics in Latvia, and was later manager of a bank. In 1935, he came to the United States to study U. S. industry for a number of Latvian enterprises, investigating import and export possibilities. The trip lasted some seven months, after which he returned to Latvia for a comparable period and then made another trip to the United States (3-4). He moved to the United States finally in November, 1937 (5).

Mr. Goland had opportunity to observe cellophane converting in Europe before his move to the United States. Cellophane in Europe was considered a luxury. It was expensive, was not moistureproof and was not applied to many products as is done in the United States. It was

(2)

used mainly for covers of jam jars and for chocolate (6-7). European producers gave no technical or sales service, no information, and no credit. Converters had to pay cash

have no desire to make a good moistureproof cellophane. Only BCL gives technical service, and that service cannot compare to that of du Pont (40-42). BCL is also the only one that tries to do a merchandising service (42). Use of cellophane is not as highly mechanized in Europe as in the United States (42). Europe produces wrapping machinery, but most is exported (42-43). Cellophane in Europe has not penetrated the mass market as it has in the United States, and until recently European producers did not attempt to do so (43-44). If U. S. film were freely available, Mr. Goland would not consider foreign film at all (44). Cellophane from du Pont is superior to any other film, more reliable and causes less trouble and less waste. European film is not uniform in gauge, with the exception of BCL (44-45).

(5)

BCL, La Cellophane, Sidac, and Transparent Paper Company exported cellophane to the United States during the last five or six months of 1950, and probably the first six months of 1951, but were not exporting to the United States in early 1952 (76-77).

Printon purchased cellophane from BCL starting in July or August of 1950, and tried unsuccessfully to purchase from La Cellophane. British film cost 75¢ or 77¢ a pound, duty paid and delivered to Printon, whereas du Pont film then cost 48¢ less 7½¢ less 1%-10 days (83-84). Printon bought the British film at this price because it could not get sufficient cellophane in the United States, and had a market for its products. This market was customers in the United States, where Printon had orders from the National Biscuit Company, Sunshine Biscuit Company,

A & P, and Colgate (84-85). Printon could have used some other material instead of cellophane. Mr. Goland wanted to use glassine and could not get any from Rhinelander Paper Co., Deerfield Glassine Co., or Riegel Paper Co., though he tried many times (85). He was not going to close Printon's plant because he could not get sufficient material in the United States; and so took a special trip to England and Europe to get cellophane, glassine, and aluminum foil (85, 134). Mr. Goland tried to get glassine to sell to the same customers that he was going to sell cellophane to, and the customers were planning to use the glassine both for the same uses they would use cellophane and for different uses (133-134). The shortage of glassine has continued. Mr. Goland now can get cellophane, but not glassine (134).

The U. S. duty on cellophane was reduced in the Fall of 1951 by 50%, from 30¢ a pound to 15¢ a pound (104-105, 138-139). If European cellophane had the same quality as American and its price were a little less, they would be able to sell it in the United States. Their price was 1¢ higher per pound before duty of 30¢, but they can always go down. One time the European price was lower than the American, but European producers raised their prices with the demand in the United States. If there is a large demand from the United States, European prices will go up; if there is a lesser demand, their prices will go down (19-20, 105-106).

Even if the American price per pound were 5¢, 10¢ or even 15¢ higher than the European price, duty paid, Mr. Goland would still buy American cellophane, because; first, he can get prompt service on any complaint and the aid of a technical man; second, U. S. manufacturers give credit

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for thirty days, so that if Printon get delivery in March, it will pay in April, whereas to purchase in Europe a letter of credit has to be established in advance and delivery is uncertain; and third, when Printon gets an order for a particular width from a customer, say 17¾", it can in the (7)
United States order the precise size wanted, whereas from Europe, since Printon's customer will not wait six months to get delivery, Printon must buy mill rolls and slit them to desired size. Slitting, cut-offs and trimming cost money (106-109). Printon's imports of BCL film were in mill rolls of 24 to 27 inch width, that had to be slit with much waste (139).

Reduction of U. S. duty on cellophane to 15¢ a pound from 30¢ a pound is not significant on purchase of foreign cellophane. The significant things are better quality of U. S. film, greater ease of buying in the United States, and no need to lay out money six months in advance, never knowing whether the foreigner will ship the film or not (109-110). Printon, which sells on ten day terms, is able to buy cellophane from domestic sources, convert it and receive payment from its customer before it is time for it to pay the cellophane producer (140-141). When Printon bought cellophane from BCL, it established a letter of credit at a certain price, C. I. F. Before the film was shipped months later, BCL twice raised the price and required increases in the letter of credit. Printon cannot operate if it has to speculate with foreign manufacturers on the price at the date of shipment. To determine its prices for converted cellophane, Printon must know definitely what the unconverted film will cost it. No converter in the United States would go in on a deal with foreign cellophane

manufacturers. The duty has nothing to do with it, and has no influence (110-111).

(8)

The profit margin of European producers of cellophane is large. On the basis of the labor factor, their production costs would be less than American manufacturers (140). Mr. Goland did not know how efficiency of foreign manufacturers compares to that of du Pont, but believed American labor has higher efficiency than European (150).

When Mr. Goland came to the United States permanently in 1937, he represented Latvian concerns for export to the U. S. of chocolate, preserves, hams, etc. (52). His brother, who had been a machine engineer in his father's converting plant, followed soon after and they planned to go into the converting business, but did not have sufficient money (16-17). They got blueprints of their father's machinery and prepared to go into converting (17). During 1938-40 the brothers operated under various trade names in importing Latvian products, mostly food stuffs. These importing companies have long been liquidated (52-54).

Printon was incorporated on November 1, 1940, and had a capital of $125.00 (16, 54). Its current value is $250,000 or more (17-18). At the start, the Golands did not have enough money for the converting business. After they had built one machine they took in Theodore Leston and Boris Pragel, who invested $6000 (55). Boris Pragel, who is president of the Canadian Radium and Uranium Corp., 630 Fifth Avenue, New York City, had 25 per cent of the

(9)

stock until the Golands bought him out in March, 1950.

Leston was a director and stockholder until the Golands bought him out. Charles Brainer was also a director in the past. The directors of Printon today are Marc and Lou Goland (54-55).

Printon began conversion in 1941. Its initial activities were printing, cutting and coloring cellophane. Bag making started in 1945 or 1946. 80% to 90% of the business is printing, laminating and coloring (59-60). Printon also does metallizing, coating, slitting, rewinding and sheeting. It works with cellophane, C-A, polyethylene, pliofilm, aluminum foil and paper. All items it makes are mainly used for packaging, especially of perishable foods (18).

Between 1940 and 1943, Printon purchased film in the open market from customers or other converters, and also got film from customers who obtained it from du Pont or Sylvania, and printed it or made bags from it for them (27, 60-61). It did not buy foreign cellophane because due to war it could get none (61).

Printon has purchased du Pont cellophane mainly, but has also converted cellophane purchased from BCL and Sylvania, and both du Pont and Sylvania film purchased in the open market (19-20). The du Pont quality makes its cost less because of less waste than with the film of other producers due to the smooth and even winding of du Pont rolls (18-20).

(10)

Du Pont cellophane is the best made. British is less satisfactory, but the best in the rest of the world (20-21, 89). Printon has and still gets Sylvania film from its customers for job printing. Sylvania makes a good cellophane that takes printing well but Mr. Goland would rather have

du Pont (89-91). Du Pont film gives better results, especially in bag making, and has better heatseal (89, 134-135). Du Pont rolls are very smooth on the side and not telescoped. If a roll is telescoped even 1/32 of an inch, it is no good (89-90). If Printon gets an order for a 17¾" wide printed roll for bread, it orders from du Pont exactly that width because due to the smooth roll it can print the full width. When Printon buys from other manufacturers, even the British, it must allow an additional ½" for trimming a ¼" off each side before printing. That additional ½" amounts to a lot of money and additional labor (90).

When there is a shortage, Printon will buy from anyone, including Sylvania. If Printon could get adequate supplies from du Pont, Sylvania or Olin, it would prefer to get du Pont material, unless the others improve to du Pont quality. If they improved, Printon would buy equally from all three (90-91). On moistureproof heatsealing films (MST), Olin's and Sylvania's price is 1¢ higher than du Pont, and in addition du Pont gives a 7% converter's discount as against 5% from the other two (47, 68). If (11)
Sylvania quality were equal, Mr. Goland would buy some film from Sylvania because only one customer a year referred by Sylvania to Printon would compensate for the loss of 2% on converter's discount (91-92). Mr. Goland has worked a lot on Sylvania film, but almost 90% of his experience has been with du Pont film (92-93).

Printon first tried to purchase film direct from Sylvania in 1940, but even yet has not been accepted as a converter by Sylvania (21-24). On many occasions Mr. Goland has tried to get cellophane from Sylvania, and each time was

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told "We will come over to you when the time comes." The reasons Sylvania gave were shortage and not taking on new converters, but in every year from 1941 through 1947 Sylvania did take on other converters but not Printon. Many of the new Sylvania converters in 1945-1947 had no experience in working with cellophane, but Mr. Goland did not know whether or not these were war veterans (93-94).

Printon has purchased film direct from Sylvania only two or three times. It wanted more but could not get it (68-69). In 1943 or 1944, Sylvania sold Printon two or three lots of film about ¾" wide and coated white which had been rejected by other converters. Printon got no converter's discount on the 10,000 to 20,000 lbs. involved. About January 1951, Printon purchased 5,000 to 10,000 lbs. of standard film from Sylvania with a converter's 5% discount but did not get the width it wanted (20-24, 68-69). (12)

Mr. Goland identified the document marked "Goland Exhibit 1" as a true copy of a letter dated January 17, 1950, from Printon to Sylvania Division of American Viscose Corporation (Sylvania) and testified that the statements in it are true. He identified the document marked "Goland Exhibit 2" as a true copy of the reply, dated February 8, 1950, of Sylvania to Goland Exhibit 1 (24-25).

Mr. Goland discussed the purchase of film with B. Y. Bandy of du Pont in 1941. Mr. Bandy explained that Printon did not yet have equipment, but when du Pont saw the work Printon could do, du Pont might consider selling it cellophane. Du Pont did not refuse to take Printon as a converter, but said it would be useless. At that time much cellophane was used for Government purposes and du Pont could not spare any (25-27, 61-62).

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Mr. Goland did not think he talked to anyone in the converting industry about du Pont's refusal to sell him cellophane at that time. He did not complain to Felix F. Rodd of the National Transparent Manufacturing Company (62-64). Rodd asked why Mr. Goland did not get some du Pont film, and he told Rodd that du Pont didn't take on new converters, but did not complain, or tell Rodd du Pont was arbitrary or unreasonable (63-64).

(13)

Mr. Julius Renninger came to Printon's office April 21, 1950. Mr. Goland did not remember being asked whether du Pont ever refused to sell him cellophane, or whether he had complaints against du Pont. He told Mr. Renninger he was satisfied with the service he was getting from the du Pont Company (64-66, 142). From the Renninger interview, Mr. Goland understood the Government might call him as a witness. He had no complaints against du Pont, and has been treated fairly by du Pont (142-143).

Printon first obtained cellophane direct from du Pont about 1943. These were small quantities which increased later. Later on, in 1945, it signed a converter agreement with du Pont, which did not require it to buy from du Pont (25-27, 67-68, 97). Du Pont never asked Printon to buy all its cellophane requirements from du Pont (125).

In 1950, Printon was getting 25,000 to 30,000 lbs. of cellophane a month from du Pont. It had been getting on allotment 20,000 lbs. a month, plus sufficient narrow rolls that were ex-quota to make a total in some months of 33,000 or 34,000 lbs. (69).

(14)

Before Printon was buying directly from du Pont, it obtained technical assistance, bulletins and price informa-

tion from du Pont. This type of service continued and improved after Printon started purchasing from du Pont. The technical assistance was rendered whenever Printon wanted it, including Saturdays and after working hours (27-28). Du Pont provides manuals on how to handle and protect cellophane that are distributed to Printon's men (30). Du Pont's technical assistance has been priceless to Printon, and has helped Printon's substantial success (28-29).

As between du Pont, Sylvania and BCL, du Pont is the best as to heat seal because of du Pont's manuals showing the characteristics of each type and which gives the best seal and service under varying conditions for different products. Other cellophane manufacturers do not give comparable information (45-46). Du Pont's chart of particular type of film recommended for a certain product has been helpful to Printon, which gives the charts to all its salesmen (112-113). Certain types of cellophane are better suited for the wrapping of certain types of products (113). The number of different types available to Printon has been important to its development. It uses MT-35, MAT, K-202, MST-51, 52, 53 and 54, and MSAT (46-47).

During the war, Printon converted Sylvania film on a job basis. It requested technical assistance from Sylvania several times, but did not get it (47-48). Printon got Sylvania cellophane from a customer supposed to be heatsealing (15)
and made bags. The bags were rejected for poor seal. Printon asked Sylvania for the reason and couldn't get an answer right away, but later was told it should use a different type of cellophane for making bags whereas du Pont's heatsealing film can make any bag and it will heatseal. Printon

was not a direct Sylvania customer at the time (113-114). Printon also called on du Pont before it was buying cellophane direct from du Pont, and did receive technical help (48).

Since before Printon bought direct from du Pont, du Pont has recommended customers to Printon, and given market surveys which help Printon in selling. The selling assistance has continued (30). Du Pont gave Printon packaging ideas on various items, particularly fresh vegetables, fresh meats and frozen foods (30-31).

Some customers referred to Printon by du Pont, especially during the war years, had their own cellophane and wanted Printon to convert it, while in other cases, Printon supplied the cellophane. Printon's work was rotogravure printing and coating, and some slitting to very narrow widths for use as ribbons and millinery straw (94-95). Printon did not make ribbons or straw, but printed, metallized and slit cellophane for its customers who made ribbons or straw (123, 127). The companies referred by du Pont were located in New York, Brooklyn and Pennsylvania (94-95). Not all were in the metropolitan New York area, and Printon was not the only concern selling rotogravure printing in New York, although the only one with a plant there (96-97, 135-136).

Printon will get cellophane from Olin, which will increase its supply. Olin has already taken Printon on as a converter, which means Olin sells Printon material to convert (129-130).

Printon competes with any other cellophane converter, including Shellmar, Milprint, Dobeckmun, Forbes Lithograph, Cellucraft, Crystal Bag & Tube (31-32). Du Pont

(16)

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has never in any way intimated Printon ought not compete with any converter, or limited the territory in which Printon sells (32-33). Printon sells wherever it can get business, including both domestic sales and exports to Europe, Latin America and Ireland (32-33).

The number of converters has increased tremendously since 1945 (48).

Principal end uses of Printon's converted cellophane are: candies, chocolates, potato chips, meat products, foam rubber cushions, automobile seats, nylon hose, brassieres, ties, shirts, bread, cake, cheese, baked goods of various types, cosmetics, soap, face powder, paper goods, plastics, and many more items. Its business is a cross-section of the American industry of wrapped items (49).

(17)

Mr. Goland received a letter from the Department of Justice dated August 2, 1951 asking for information on Printon's converting activities. He did not answer it because it was a complicated letter with many questions, and to give truthful answers as he desired would require so much time doing paper work and research work that he would not be able to continue his business. He was leaving in September for Latin America on a business trip and returned only in November (55-56). No one else in the firm could have answered the letter. He had no second request from the Government authorities about it (56-59).

Glassine has been in short supply since 1950 and was in short supply during the war years. Printon could not get all it wanted of any product during the war years (50). Printon pushes cellophane in the packaging field instead of paper or aluminum foil, although it probably would make

more money on foil or paper, because the producers of glassine and foil are printers and compete with the converters, whereas the cellophane producers are not also converters (50-51).

During 1951, Printon purchased only a few thousand pounds of aluminum foil, due to limitations. Prices were highly competitive because Reynolds was competing on converted foil. When Printon developed an account Reynolds would take the account away at a lower price (70-71). Printon will not buy foil from Reynolds, for this reason (73).

(18)

During the last 4 or 5 years, Printon bought 10,000 to 15,000 lbs. of glassine annually. It was not worthwhile to go into that business because of the competition from glassine manufacturers. When Printon developed an account, Riegal Paper Co. would make an offer of converted glassine at a lower price because Riegal did not have to make any profit on printing, and sometimes got the business (71-72).

Printon purchased cellulose acetate from Celanese Corporation rather than du Pont because du Pont's price was higher (72-73). It purchased probably 15,000 lbs. a year, or more.

Printon purchased a few thousand pounds of polyethylene in 1951, there being limitations on it. It has been buying polyethylene for about three years (73-74).

Printon uses some pliofilm, mostly from customers. It has started to get some from Goodyear, but could not get much from them before. Goodyear's technical and delivery services are not too good (74).

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~~D.X. 1015~~

Printon has not had patent difficulties with other converters. Shellmar had patents on rotogravure printing which expired in 1948 or 1949.

In January 1952, Printon was able to get all the cellophane it wanted; but there was a shortage beginning at the start of 1950 and lasting through 1951. Cellophane is still on allocation, and Printon could use more (75-76).

When Printon couldn't get enough cellophane, it started (19)
to use more cellulose acetate to replace cellophane. This was not always possible because acetate was a hand operation, was not heatsealing, and would not operate on automatic wrapping machines because of static. Acetate did replace cellophane for overwrapping tomato trays (84-87). Cellophane overwraps for tomato trays do not have to have holes. In the winter time, but not in summer, nonmoisture-proof cellophane is used as a wrapper for tomatoes (84-88). Although acetate costs more than cellophane per pound, it gives greater yield. The acetate Printon uses has a yield of 24,000 to 25,000 square inches per pound against 300 MST yield of 19,500 (84-88).

In Europe, cellophane is a luxury, principally used to package goods exported to the United States (77). European exporters think this is necessary because cellophane is a better selling point. Chocolate wrapped in cellophane looks better. Chocolate or cosmetics are exported from Europe to the United States already wrapped in cellophane principally for the eye appeal rather than for protective qualities (77-78). For protection, glassine would not do because cellophane will stand more abuse than glassine, but Mr. Goland believed the exporters consider eye appeal more

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than protection. Holland does not produce cellophane, but is an important customer of Belgium and France on cellophane because Holland exports all over the world (79-80).

Eye appeal is anything that attracts the customer's eye. (20)

It depends on the converter, who can make something out of a material that will have eye appeal if the customer wants to pay for it. Rotogravure printing on paper has very good eye appeal, and Printon puts on a glossy coating which makes it almost as good as cellophane (130-131).

Transparency of cellophane in addition to eye appeal has an important bearing on the use of cellophane wrapped goods imported from abroad, for a person who buys a product wants to see what is in the container. Examples of this are tomatoes and cake. Transparency is an important item for the wrapping of articles where visibility is an important factor, and the more transparency the better (80-81). Glassine is not considered transparent as you cannot read well enough through it, but is competing with cellophane in price. Glassine is 20¢ to 22¢ a pound whereas cellophane is 55¢ a pound. When cellophane was 41¢ a pound, Glassine was 17¢ or 18¢ a pound and they were competing where price was concerned (81). Glassine is transparent, but cannot be compared to cellophane as to this (145). All 5¢ candy bars are wrapped in glassine due to the price situation. Due to the low margin of profit, the candy manufacturers cannot afford to spend more for the cellophane wrapper (81-82).

Cellophane as a wrapper tight over chocolate, such as a candy bar, does not tend to smear if a non-moistureproof cellophane is used. Non-moistureproof cellophane is ob-

tainable today, but most cellophane used today is moisture-
(21)
proof. Only certain products, such as nylon stockings, are in non-moistureproof (82-83).

Cellophane gives better protection and sanitary qualities, and wrapping a product in cellophane makes it more attractive (97-98). Even matches wrapped in cellophane will sell better than matches not so wrapped, due to better appearance (98). Cellophane has eye appeal which is in addition to transparency. For example, in many cases Printon puts a multi-colored overall coating on cellophane so that there is no transparency, and still the wrapper looks better than anything else (98-99). Transparency does not contribute to the eye appeal of the overprinted cellophane (130). Foil has eye appeal on candies (130).

Printon sells cellophane for wrapping many types of breads, including the regular white breads and ryes (34, 99). Most bakers would like to wrap white bread in cellophane, but if all white bread in the U. S. began to be wrapped in cellophane, there would be an immediate shortage of film (99-100). If a popular white bread manufacturer started selling his bread in cellophane, a number of others would follow (100). The smaller bread manufacturers today in proportion use more cellophane than the big ones. Levy Bros., in Brooklyn, wrap 50% to 60% of their bread in cellophane feeling that they get better sales and it is a way for them to take away business from the larger companies that are wrapping bread in paper or waxed papers (100-101). This company wraps some loaves in
(22)
wax paper and other loaves of the same bread in cellophane, and sends the loaves to the grocery store, half of them in

one wrap and half in the other (137-138). Sometimes this is white bread. This is done to attract the customers; wax paper attracts, but not as much as cellophane. The bakers probably put some of the loaves in cellophane to get visibility of the product (149). The principal types of bread wrapped in cellophane are specialty loaves, but the smaller bakers will wrap any bread in cellophane because they want to get in the market. The cellophane wrap helps them to a certain extent if the bread is good and the price is right (101).

Printon was unable to displace waxed paper with cellophane as the wrap for "Tootsie Roll", a penny item, simply because it is cheaper than cellophane. The fact that Tootsie Rolls have long been wrapped in waxed wrap could have something to do with its continued use, depending on how conservative the concern is (35-36, 101-102). Many one cent candy items are wrapped in cellophane (138). The same company that makes Tootsie Rolls wraps some lollipops in waxed paper and some lollipops in Printon's converted cellophane. All are the same type, sold to the same trade. Those in cellophane are so the people can see what is in it, and in that way the company offsets the price by merchandising the item (35-36, 103).

(23)

Metro Chocolate Company changed from glassine and waxed paper to Printon's converted cellophane for wrapping a 5¢ chocolate bar to increase sales, and sales increased. Phoenix Candy Company, producers of toffee and other candies, turned to cellophane on some numbers and left others in waxed paper (34-35). An item in waxed paper looks cheap because one cannot do very fine printing on

waxed paper or glassine. On cellophane the right printer can beautify the wrapper and that will increase the sales, and that is what happened. If the article was formerly wrapped in glassine or waxed paper, it probably would not get the same attention as it got from wrapping in cellophane (111-112).

Printon feels a cellophane wrap gives better protection, is more sanitary and is a better point of sales because the housewife can see the product, and Printon stresses that transparency is very important (33-34).

The printability of materials depends to a large extent on the skill of the printer and the method used, whether letter press, aniline or rotogravure. Printon can print on paper as well as on cellophane or on glassine and *vice versa* (115-116). Polyethylene and cellulose acetate are not as good as cellophane for printing, but again it depends on the know-how of the printer (117). During the 3 years Printon has been printing polyethylene, the quality of the printing has improved, and Printon's costs of printing it have been reduced (139).

(24)

Printon uses plain foil and also does its own lamination. .00035 inch gauge is used unsupported and unlaminated for some packaging; or in other cases in laminations to paper or films for packaging (117-118, 132-133, 147). About 90% of the foil sold by Printon is laminated, due to Reynold's competition. Non-laminated foil in .00035 gauge can be used for wrapping candy and could be used for many other items (119-120, 147-148). Pinholes exist in foil in both lighter and heavier gauges (148).

Foil costs about 50¢ a pound on the average, but the thinner gauges like .00035 cost more than .001 or .002

gauges. Foil is sometimes used in a strip around candy with cellophane over it, the foil for brilliancy and the cellophane for protection and to show the foil (119-120). On some products, the eye appeal of opaque foil will be better than that of cellophane, but it is difficult to compare the eye appeal of one item with that of another (144-145). Foil a little bit heavier than .00035 is used for protection on products such as dehydrated soups, where cellophane is not used. Printon unsuccessfully tried to sell cellophane to Lipton Soup, who said foil was better. One cannot use cellophane everywhere, it all depends on the product (120-121).

Cellulose acetate is not heatsealing unless a thermoplastic coating is put on which Printon does, but this increases the price (121). Tomatoes are overwrapped in

(25)

cellophane or cellulose acetate, and when sold in window boxes, the window is cellophane or cellulose acetate (131-132). Cellulose acetate is better for lamination than cellophane because it shrinks and curls less than cellophane (132). Cellulose acetate has better appearance than cellophane because it is clearer and has more brilliancy. It has not supplanted cellophane because it cannot be heatsealed and is not as moistureproof (140, 145). Furthermore, cellulose acetate has a disadvantage in its static which affects its machine running quality (145-146).

Cellophane will run on automatic wrapping machines as well as waxed paper. Acetate will not run as well. Polyethylene is not being used for wrapping, but only for bags. Foil is used on wrapping machines only as a strip (121-122).

Mr. Goland was not familiar with the du Pont terminology as to "converting" and "fabrication" (122-123).

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The converter customer does not always designate the type of wrapper wanted. Sometimes the converter proposes new ideas, and its salesmen will convince the customer that wrapping in cellophane or acetate or something else is better than his current wrapper (149-150).

Printon, never a promotional converter, has used the du Pont trademark on its stationery and invoices constantly ever since it signed a converter agreement in 1945. It has used its own labels on its shipping cases and not mentioned du Pont because it has been using other cellophane, such as British and Sylvania, and therefore could not put on the du Pont label (125-126).

(26)

Printon has often made sales of unprinted film in roll form on emergency request as a convenience for a customer, without asking du Pont. A converter discount had been received on this film (123-125, 127-128). It does not do a regular business of selling unconverted cellophane as it cannot make money on it, and these sales are a small part of its business. On these sales of unprinted cellophane Printon has always reslit to customer's order a roll as received from du Pont, and sold the reslit roll. It is not interested in transferring the material it gets from its warehouse, as it can make money only when it prints, coats, or does some processing (128-129).

At times Printon may have purchased a roll of cellophane from du Pont and sold that roll just as it was to a third party during a time when it was getting its converter discount. However, the usual way is the sale of an odd size that Printon made on a larger order and could not sell. Printon may keep the remainder of the order for three months

and, if it does not get a call for that size, will then sell this residue of the odd size because otherwise its money is tied up and the cellophane deteriorates if it is kept too long (143-144). When Printon orders cellophane from du Pont, purchase is always for the purpose of printing or processing, and it cannot tell how much will be resold without slitting or printing (151).

Defendant's Goland-Exhibit 1

REGISTERED MAIL

January 17, 1950

Sylvania Division
American Viscose Corp.
122 East 42nd Street
New York 17, N. Y.

Gentlemen:

In November 1940 we started our business and approached the Sylvania Industrial Corporation about becoming a converter of their cellophane. At that time, we were told by Mr. Steiner and Mr. Hamburg that they could not take in any new converters.

We spoke to the same two gentlemen in 1941, 1942, 1943, 1944 and 1945. During that period Mr. Steiner visited us many times and he always claimed that they weren't taking in any new converters. In 1946 we again approached your office and were told the same thing.

In 1947 the writer of this letter had a conference with your Sales Manager, Mr. Little, together with Mr. Mohlman at your office. Mr. Little told the writer that during all that time they hadn't accepted any new converters.

Six weeks ago we approached Mr. Mohlman and he again turned us down telling us to call in January 1950. The whole situation is very strange to us.

During that period you have taken on a number of converters that sprung up during the war and after the war. You sold cellophane to anyone but us.

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We have been specializing in Rotogravure printing since November 1, 1940 and have contributed, to a great extent, toward the improvement of cellophane wraps for various purposes. Actually, we are the only Rotogravure printers in New York City and are really surprised that any time we contact you we are always turned down by your claiming you can't supply the cellophane due to the shortage which prevents your taking any new converters.

(2)

We would appreciate it if you would accept us as a converter of cellophane and sell us your material.

Thanking you for your kind cooperation and looking forward to hearing from you, we are

Very truly yours,

PRINTON CORPORATION

Dr. Marc Golandsky

MG:ek

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Defendant's Goland Exhibit 2

SYLVANIA DIVISION

AMERICAN VISCOSE CORPORATION
NEW YORK 1, N. Y.

February 8th, 1950.

General Sales Office
350 Fifth Avenue, New York 1, N. Y.
Phone LAckawanna 4-7200

Plant
Fredericksburg, Va.
Cable address: Sylvania, NY

Printon Corporation
310 East 23rd Street,
New York 10, N. Y.

Att: Dr. Marc Golandsky

Dear Dr. Golandsky:

Referring to your letter of January 17th, and confirming our conversation at your office on February 2nd, we find we can make no commitment as to when we will be in a position to include your company as a converter of our cellophane.

Yours very truly,

SYLVANIA DIVISION
AMERICAN VISCOSE CORP.

/s/ J. G. Mohlman

J. G. Mohlman.

cf

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(1)

NARRATIVE SUMMARY OF DEPOSITION OF ALEXANDER A. McCURRY

Taken January 21, 1952, at New York, N. Y.

Alexander A. McCurry resides in Amityville, Long Island, New York. He is Manager of the Packaging Division of the Purchasing Department of the National Biscuit Company*, and has been connected with packaging since before 1926 (2). He has been employed by NBC during the periods 1926-1931 and 1938 to date (3-4).

Principal products of NBC are biscuits, crackers, bread, cake, cereal, dog food and ice cream cones. The term "biscuits" includes sweet goods, such as cookies and filled crackers, and sponge goods, such as soda crackers (5-6). NBC sells nationwide, and has subsidiaries in Canada, England and Venezuela. It is one of the largest U. S. companies making biscuits and crackers (6-7). Among its brand names are Ritz, Premium, Uneeda Biscuit, Fig Newtons, Oreos, Lorna Doones and Swiss Cream Sandwiches (7-8).

NBC packages in cellophane part of its production of white bread, specialty breads, sweet goods, Brown 'n' Serve items and crackers, and all of its cake. Prior to 1931, NBC was packaging biscuits and crackers in the conventional package, which consists of a light weight cardboard (2)

shell, a waxed glassine liner, an overwrap of printed paper, and labels sealing each end (hereafter called "conventional

*Hereafter called NBC.

carton") (8-9, 12-15). In February 1931, it began packaging sweet goods, such as Oreos and Fig Newtons, in cellophane bags made by Shellmar of du Pont film (8-9, 60-61). A few years ago, NBC also began using a package for sweet goods consisting of a cardboard tray, with the two ends folded up, overwrapped with cellophane. This was a machine operation and less expensive than hand filling cellophane bags (9). NBC still uses both cellophane bags and overwrapped trays, as well as the conventional carton and printed cartons, for sweet goods (9-10, 31-32).

NBC sells the identical sweet goods in packages that employ cellophane and also in packages that do not. Oreo cookie sandwiches are sold by NBC in five different packages. Two of the packages are different sizes of the conventional carton, two are different sizes of glassine lined trays overwrapped with cellophane or Saran, and the fifth package is the NAB, containing four cookies (19-20, 113-114). This is a glassine lined cardboard sleeve with an overwrap of cellophane and a label on the outside (19-22). Lorna Doone cookies are packed in the conventional carton and were also sold in the NAB package. In the past, Lorna Doones have also been packaged in cellophane bags (22). Fig Newtons are sold in the conventional carton, and also

(3)

in the NAB package (22). Fruit bars are sold in conventional cartons under the name Fruitana, and a slightly different fruit cookie is packaged in cellophane (22-23).

NBC's sales of sweet goods wrapped in the conventional carton and in the printed carton, both of which are in competition with cellophane packages, are larger than its sales of the same goods wrapped in cellophane (31-32).

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No NBC sponge goods, such as Premium and Uneeda crackers, are sold in a package employing cellophane except for the individual service of four Premium Saltine crackers wrapped in cellophane, which is used in restaurants, dining cars, etc. (10, 31-32). Until recently, all of NBC's crackers have been packaged in the conventional carton, or in printed cartons lined with waxed glassine. A recent development in the packaging of soda crackers and Graham crackers is the fractional pack, which is a one pound printed carton with three or four inner packages. Each inner package is a one-quarter or one-third pound of crackers separately wrapped so the customer can pull out a single one at a time. NBC considered what wrap to use for the inner packages because some of its competitors were using Pliofilm and some were using cellophane. NBC decided cellophane was too expensive, and adopted waxed glassine (14-15, 93-94).

(4)

The fractional pack is an important new package in the cracker industry, and consumes tremendous quantities of waxed paper. Many competitors of NBC use cellophane as the inner wrap for the fractional packages, of whom Schulze Birch in Chicago is one (15-16, 87-88).

NBC's Sales Department wanted and still wants to use cellophane for the fractional pack because a lot of NBC's competitors are doing it (85-86). The Sales Department thinks visibility is a factor in wrapping the inner packages, and that housewives would prefer cellophane to glassine (86-87, 94-95). Mr. McCurry did not believe that it would make much difference whether the separate packages are wrapped in cellophane or in waxed paper. Both wrapping materials give about the same protection to the crackers.

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There is a low margin of profit on crackers, and cellophane is much more expensive, but NBC has to be in competition when it sells crackers (66, 86-87). If there had been plenty of cellophane when NBC started fractional packaging, the Sales Department would have insisted on using it (87). But NBC is not going to do so (86).

NBC's other new package for one pound of crackers is a printed carton. The former package was the conventional carton, which is still used by NBC to a great extent (66). NBC hopes that instead of buying its competitor's crackers, a housewife will remember the name of NBC (5)
crackers and ask for it. Mr. McCurry believed that if a woman likes Premium crackers she will buy another box. He thought that is generally true of crackers, and that visibility would not be very important on the sponge varieties (67-68).

It would be possible to package Ritz crackers in a cellophane package if competitive conditions called for it. From a sales standpoint, the present Ritz package, a printed cardboard carton in two sizes, is doing a satisfactory job, and NBC is reluctant to make a change unless it can see a reason from the competitive standpoint. NBC does package some Premium soda crackers in cellophane and could treat Ritz in the same way (115, 118-119).

Prior to the use of cellophane, cake was packaged in glassine and some companies make specialty glassine which you can see through, although not as well as cellophane. NBC now packages all its cake in cellophane. This has been a development over the years going back to the beginning of the 1940's. Its cake competes with that put out by other

companies, most of which is wrapped in cellophane because if not wrapped in cellophane it would probably not sell. Customers want to see what they are buying (13, 79).

NBC packs its potato chips in a double wall waxed glassine bag. Before deciding to do so it considered cellophane, (6)
which was in short supply, and Pliofilm, and decided from a cost standpoint that waxed glassine was best. NBC's laboratory said waxed glassine would keep the chips just as well (16). Later it conducted a market survey in which it used a small quantity of cellophane bags in limited areas. NBC recently decided that to sell potato chips it would have to follow its competitors, and hence is now changing to a duplex cellophane bag (16-17, 76). This will increase the packaging costs, but NBC believes that by gaining volume it will be able to overcome the cost difference. It will use a smaller area of cellophane than glassine to make the bags (17). The desire to cut the quantity of cellophane is due to short supply and cost. NBC has made a survey of its plants trying to reduce the size of all its wrappers (17-18).

NBC specialty breads were packaged in waxed paper before it started using cellophane on them. In some cases it now wraps them in cellophane (10-11). In certain areas where many bread bakers are competing for business, one will start to pack bread in cellophane in an effort to get the market. Other bakers, including NBC, begin packaging bread in cellophane in that locality, and in time nobody is getting additional business, so all go back to the original wrapper, usually wax paper. This happens in place after place over the years. The breads involved are mostly ryes (7)
and whole wheats (10-12, 68, 75-76, 104). NBC wraps

white bread in cellophane only in Cleveland and Pittsburgh, to meet competitive conditions, and everywhere else in waxed paper (12).

At one time, Bert Martin, President of Shellmar Products Corp., approached NBC to use cellophane generally on its white bread production. He proposed a lower price than anybody else for printed cellophane bread wrappers. When NBC figured out the cost, it decided against it because the cost was greater than the sulphite waxed paper bread wrap (33-34).

There is a low margin of profit on bread (68). In the Cleveland and Pittsburgh situation where NBC followed a competitor and wrapped bread in cellophane, NBC wanted to get away from wrapping in cellophane because of cost. In certain markets it has to continue because its competitors are doing so (78-79). In the cases that NBC wraps specialty breads in cellophane, Mr. McCurry believed that if NBC switched to a non-transparent wrapper, it would not get the business (79). NBC's volume of sales of breads in the regular waxed wrapper are considerably larger than its sales of bread in cellophane (31-32).

In choosing a flexible packaging material, NBC takes into consideration protection, price, quality and service (49). The price relationship between packaging materials and the price reductions on cellophane have had considerable effect on NBC's purchases of cellophane. It analyzes (8)
prices very thoroughly before it purchases packaging materials (27-28, 32).

Glassine and sulphite paper are lower in price than cellophane, and wax paper much lower (64). Aluminum foil is higher. It is not transparent although some of NBC's

competitors use it (65). Saran is higher in price than cellophane. Pliofilm is not quite good enough for NBC yet. It has been watching the development and used it experimentally, but not commercially (65-66).

So far as [illegible] concerned, the lower price of waxed paper and printing sulphite put cellophane at a competitive disadvantage for some products. In determining whether or not to use cellophane, for example on bread, NBC compares the price of cellophane with the price of waxed paper and sulphite (109).

Du Pont salesmen have often come to NBC and tried unsuccessfully to get it to adopt cellophane for a package or a product. Du Pont salesmen were constantly trying to develop business, which NBC liked. They came and helped NBC and made market surveys and showed NBC little changes that should be made. Nevertheless, on some of the suggestions, NBC did not adopt cellophane if it could not afford to do so (108-109).

NBC has a Packaging Committee, of which Mr. McCurry is a member. It consists of representatives from the Executive Staff, Purchasing Department, Engineering (9)
Department, Production Department, Direct Sales & Marketing Division, and the Laboratory. Based on suggestions from the field or within the organization, packages are developed and presented to the Packaging Committee and the cost is thoroughly analyzed. The Committee considers the cost of packaging in the various ways and what the package should sell for based on cost. The Committee then tries to develop an answer and make recommendations on which has been developed a complete cost study to show

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what profits might be if various materials were used (28-29, 56).

In the considerations of the Committee several different packaging materials are considered. For example, the Committee may consider packaging a product with a cellophane bag, in an overwrapped tray, in a wrapped carton, in a printed carton, or in a plain carton overwrapped in printed cellophane (29). In considering the inner wrap for fractional package of crackers, the Committee's consideration finally narrowed to cellophane or waxed glassine. The Sales Department wanted cellophane. The Committee did not recommend it because of high cost and there was not enough cellophane. It decided originally to use amber glassine which was the cheapest, but due to objection by the Sales Department that this would not sell, the final decision was to use a bleach waxed glassine (29-30).

(10)

When the Packaging Committee is considering various possible materials for a package, it looks for protective quality rather than whether a material is fibrous or non-fibrous (50-51, 91). There are no keeping qualities in an outside sulphite wrapper, but the protection is put on the inside of the package (91). With cellophane you get protection from the fact that it is moistureproof, and NBC constantly seeks to have this quality improved (91-92).

When NBC increases costs by changing from one packaging material to another for the same product, the usual result is to sacrifice profit to do a better packaging job rather than to change the price of the product. In a competitive field NBC cannot sell unless it sticks to the price (100). Some varieties of NBC products that are sold in cellophane bags are just made to meet competition and are

not simultaneously packaged in other ways. Many of NBC's products are sold both in cellophane packages and in other packages (101).

On bread and cake, NBC uses approximately 50,000 lbs. of cellophane a month. Its annual consumption of certain flexible materials in some respects has been:
(11)

Year	Wax Paper for wrapping bread only	Sulphite Paper self-printed for outside wrappers	Cellophane for all uses
1942.....	1,708,177 lbs.	9,470,167 lbs.	2,421,073 lbs.
1943.....	1,694,059 "	9,631,861 "	2,297,479 "
1944.....	1,804,244 "	9,026,792 "	2,055,296 "
1945.....	1,829,578 "	9,457,869 "	2,015,000 "
1950.....	2,006,000 "	10,104,370 "	4,291,000 "
	(24-26)	(25)	(25-26)

These figures do not include NBC's consumption of glassine or of paper used other than as outside wrappers, whereas the figures for cellophane include consumption for all purposes. NBC uses a tremendous amount of waxed glassine on the inside of packages (26-27).

In 1951, NBC ordered 2,254,715 lbs. of cellophane from converters and 2,696,611 lbs. of cellophane direct from producers (35-36). NBC purchases cellophane from du Pont, American Viscose Company (Sylvania Division) and from Olin Industries. Olin came into the picture in June or July of 1951, and since NBC was interested in getting more cellophane it worked closely with Olin to help them develop a cellophane satisfactory to NBC (36, 56).

NBC was not getting all the cellophane it needed in January, 1952. NBC's monthly allocation from du Pont is
(12)
175,750 lbs., from Olin 60,000 lbs. and from Sylvania

27,000 lbs. NBC tries constantly to get more from Sylvania (81). Mr. McCurry did not know how far the Sales Department could go in selling more cellophane packaged items and how far the Production Department could go in producing, but did know that the Company was anxious to sell as many packages as it could, and that if NBC could get more cellophane it would probably use more (80-82).

NBC has felt the shortage of cellophane since around the first quarter of 1950, when both du Pont and Sylvania put NBC on allocation. A principal cause of the shortage was that many meat packers were beginning to use transparent materials for the first time (82-83). Prior to the first quarter of 1950, there was not an abundant supply, but NBC got a fair share of what was being made. There probably was a shortage (83).

However, prior to January 1950, du Pont did not turn down any NBC orders for cellophane. NBC was probably on allocation during World War II, but the quota answered its requirements (104 105, 116).

In speaking of inability to get sufficient cellophane for the inner fractional cracker wrap, Mr. McCurry meant more cellophane than the Company's consumption in 1950, which was 100% greater than in 1945. Use of cellophane by NBC for the fractional cracker pack would run into millions of pounds (30-31).

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There is no indication whatever that du Pont deliberately brought about the cellophane shortage. Sylvania is also short of supply, and NBC is trying all the time to get more (105-106). NBC is purchasing relatively smaller quantities from Sylvania today than from du Pont, but it has

never had any understanding with du Pont to minimize its purchases from Sylvania (106).

Glassine was in short supply during the war, and at times since the war (46-47).

In 1950, NBC purchased about 360,000 lbs. of French cellophane and 60,117 lbs. of British cellophane. Before duty of 30¢ a pound, the French cellophane cost 52¢ F. O. B. New York for 300,000 lbs., and 57.2¢ for 59,960 lbs. On the same basis, the British cellophane cost 38¢ for 20,000 lbs.; 37½¢ for 10,000 lbs.; and 43.8¢ per pound for about 30,000 lbs. (37). The purchases were through agents named Gaillet & Hartig, 250 Park Avenue, New York, New York (37). NBC was not offered foreign film other than the French and British (39).

NBC got no technical or merchandising service from the French or British. The foreign film worked satisfactorily (38).

NBC has not continued to purchase from foreign producers. It tried to buy, but cellulose pulp got scarce, and foreign producers quoted prices for cellophane up to $1.00 a pound before duty. Later, the foreign producers pro-
(14)
posed that if NBC would supply the pulp, they would make cellophane from it. Pulp would have cost NBC probably $350 or $400 a ton, and NBC did not know what it would get back, and the deal just couldn't be handled that way (38).

NBC began purchasing cellophane directly from du Pont in the early 1930's (98). Since that time, NBC has principally used du Pont cellophane (43-44). Although NBC's purchasing policy is to have a number of suppliers for any

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material, it did not purchase cellophane from Sylvania until 1948 (107).

The principal reason for NBC's preference for du Pont film was the unsatisfactory quality of the Sylvania product, as to workability on machines and clarity of the sheet (107-108). NBC tested Sylvania film in laboratories and in trial plant runs (108). All of NBC's plants were reluctant to use Sylvania cellophane because it was more cloudy than du Pont's and did not seal as well. Converters also said it was not as good for printing as du Pont film (41-42). Sylvania quality has improved, particularly since World War II, and now approaches but does not equal du Pont (43). NBC learned to use Sylvania film during the shortages, and can now heatseal it without difficulty (42, 77-78).

Olin's cellophane is as good as that of du Pont, and better than Sylvania's.

(15)

NBC received a cumulative annual quantity discount from du Pont on direct purchases until 1947. For the twelve months ending September of the years indicated, the rates and amounts were: 1944, 4½%, $19,971.17; 1945, 5%, $26,529.24; 1946, 3¾%, $10,825.26. For the period October 1, 1946 to December 31, 1946, the rate was 4¼% and the amount $4,083.56 (62-63). Satisfactory quality is more important to NBC than rebates (99). The discount would create a certain tendency to buy more from du Pont, but the other factors were reaction to Sylvania film by plant managers, who do not know the terms of the purchase (63-64). Sylvania had been trying to sell NBC, but not a great deal prior to 1948 (98-99). Mr. McCurry did not think Sylvania had offered a quantity discount (99).

In addition to quality, other reasons for NBC's purchasing principally du Pont film rather than Sylvania were technical services, sales services, superior delivery service, du Pont's greater production, and the fact that du Pont was there first and helped NBC get started using cellophane (39-41, 43-45). Prices have been about the same with small differentials. Olin and Sylvania are now 1¢ per pound higher than du Pont on 300 gauge moistureproof heatsealing film (44). Du Pont has given much technical service, and its men have worked with NBC's laboratories, plants and bakeries on cellophane problems (39-40). Du Pont helps NBC develop packages, and provides market (16)
surveys that tell what is happening in the stores (39). NBC has received little technical or merchandising service from Sylvania, which does not have the type of organization to give it (41). NBC has never received a market survey from Sylvania, for example (109). Du Pont's delivery service on the numerous sizes of film NBC requires has been better than Sylvania's, but Sylvania has improved recently (45).

NBC uses only roll cellophane. Neither NBC nor any similar user would attempt to use cellophane if only sheets were available, due to the labor cost of hand wrapping (34). NBC uses only moistureproof cellophane and has no use for non-moistureproof (33).

Much of the growth of NBC's use of cellophane is due to automatic packaging machinery, which increases production and reduces cost (32). Its purchase of wrapping machines for cellophane was its own idea, based on the economy of greater production with a machine overwrapped tray than with hand filled bags (60). NBC does not use other materials on these machines, although some others

could be used with some adjustment of the heating. NBC tried to modify one cellophane machine to use Saran (59-60). The fact cellophane or other materials will work on machines is important to NBC, and enters into its cost considerations (98, 106). Although cellophane does not give a faster wrap than other materials, its speed has (17)
increased (110-111). NBC uses packaging machines with other materials (97). When using either waxed paper or heatsealing cellophane, the heating elements of the machine must be cleaned out periodically (98).

Practically all NBC's products now go to the purchaser in a consumer size unit as opposed to a bulk package. Only in the midwest is merchandise packed in cracker caddies, bulk packages of five or ten pounds, and most of them go to the restaurant trade. The individual four-cracker cellophane package of Premium Saltines was developed because once the bulk pack is opened it has no keeping quality. NBC studies all its packages as to the time it takes to get them to the stores and what the shelf life* is, and every man in the field watches the packages. If the product gets too old, NBC takes it out of the store to avoid selling a stale product (52-54).

At one time much of NBC's business consisted of sales in larger than unit size packages. In 1926, it was using 5,000,000 caddies a month. Today it uses less than 1,000,000 a month, although its overall business has grown substantially. The package must now be such that a woman in a supermarket will pick it up and buy it (54-55). The period

*The period the package will keep the product in acceptable condition in a normal grocery store (54).

of greatest growth of the supermarkets has been over the last ten to fifteen years, and the growth is increasing (55-56). (18)

Some of the companies supplying NBC with other flexible wraps are: bread wrappers, Nashua Gummed & Coated Paper Company; label paper, Oxford Paper Company; Saran, used experimentally, Dow Chemical Company; Pliofilm, experimentally, Goodyear; lining paper, Riegel Paper Company, Specialty Paper Company, Central Wax Paper Company, Pollock Box & Paper Company; glassine, Rhinelander Paper Company, Deerfield, Riegel, and others (45-46).

NBC has purchased converted cellophane from Shellmar, Roto Bag Company, Union Bag & Paper Company, Kellogg Container Division of U. S. Envelope Company, Package Craft, Milprint, Nashua Gummed & Coated Paper Company, and Fabricon. It has purchased converted glassine, but not converted cellophane, from Daniels (47, 57-58). NBC purchased waxed paper and cellophane from Nashua, and other packaging materials from other converters from whom it purchased converted cellophane, such as glassine bags from Union Bag & Paper Company (47-48). NBC buys a lot of glassine bags for the restaurant trade, and has many suppliers of them (48).

The companies that sell NBC waxed paper have not attempted to displace cellophane on the basis of cost. Nashua tried to get NBC interested in plain and printed cellophane bread wrappers that other customers were using. In the case of converters like Nashua, the same salesmen handle (19)

the whole line of wraps, both waxed paper and cellophane (109-110).

NBC does not convert cellophane by printing or bag making (56). It manufactures some cardboard, and has a plant that makes cartons and prints paper wraps. NBC uses these cartons to package Ritz, Nabiscos, Premium crackers, pretzels, etc. These plants compete with outside industry, and provide a saving. Another large baker makes its own cardboard (89-90).

Moistureproofness of cellophane has been rather uniform. Du Pont had tried to develop a new type with greater protection, which NBC would welcome (92-93). Two sheets of 300 MST cellophane give as good protection as waxed paper, but whether they give better depends on the article wrapped (68-69).

The magazine "Modern Packaging" and many others are distributed throughout the NBC packaging organization (79-80).

People say Shredded Wheat needs air circulation, so no wrap would be ideal, but whether that is true has to be proved in a laboratory. It is packed in an unlined carton and keeps satisfactorily (88).

All NBC's packages of every type must provide protection for the product and sales appeal (96-97). Cellophane that gave no moisture protection would be useless to (20).
NBC (95-96). NBC's use of cellophane has grown due to public demand and impulse buying, particularly in supermarkets (18). In such stores every package must be a silent salesman, and NBC seeks to make them so, regardless of material (18, 51). Cellophane creates impulse buy-

ing because women like to see the product (18, 76-77). A well-designed opaque package also creates impulse buying, as NBC has proved with Ritz crackers, one of its best sellers (103-104). Wraps and cartons of opaque materials are printed in ways to attract attention and sell the product (18, 51). Cellophane also is decorated by printing to attract attention (51).

NBC uses the following flexible wrapping materials: sulphite paper as an outside wrapper of cartons, label paper, waxed sulphite for bread, waxed glassine, and cellophane (20). It has experimented with foil, which it found a little too expensive, with Pliofilm, which is not yet satisfactory, and with Saran, which needs to be improved as to stretching and shrinking (20-21, 90-91). Pliofilm's price is the same or a little higher than cellophane; Saran is higher than domestic cellophane and lower than foreign (84-85, 90-91).

Every package that NBC displays in a grocery store and every package of its competitors, whether they be wrapped in a package or packaged in cellophane, are all in competition. The salesmen of the various packaging materials come (21)
to NBC and try to sell their products. Also, the converters who sell converted cellophane compete with each other for NBC's business (48-49).

From Mr. McCurry's experience, there is not a separate market as such for cellophane as a flexible packaging material. NBC has had some cookies packed in a printed carton wrapped in plain cellophane. One of its competitors will package a similar product in a plain carton wrapped with printed cellophane. NBC's Sales Department may

believe the competitor's package sells better. NBC is now changing one of its packages to a plain carton with a printed cellophane wrap, which is designed to attract the customer. Similarly, display value has much importance to non-cellophane packages (48-49).

There has been an increase in the use of packaging materials since 1945. NBC like everyone else is trying to increase its business and do a better job price-wise, display-wise, merchandising point of sale and everything it can to make the housewife buy its products (51-52).

Some products can be wrapped either in a cellophane package or another type and still get the same protection, and both packages can do an effective merchandising job. This has been proven by NBC's general packaging in non-transparent material, and NBC is doing a tremendous volume of business in packages with sulphite paper on the outside. People still buy packaged goods when the package tells the story (74-75).

(22)

NBC wraps some of its products in cellophane and also in other wraps because it has created a demand for the particular product, and in order to get it into the visible show case in the grocery store and meet competition, it has also packaged the product in cellophane. Some people like one packa[illegible], and some another. They are used to NBC's type of package, but they are in direct competition with others and the consumer can buy either package (112). NBC has built up consumer preference in certain people for a product which they associate with a particular wrapper. The price of the package has a bearing on this (112-113).

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In Mr. McCurry's opinion, cellophane should be used to introduce new products, which after an initial period would be switched to another wrap, but NBC's Sales Department does not agree (74, 102, 116-117).

There are substitutes for cellophane for packaging saltines, sweet goods, white bread, and potato chips. As to the last, to meet competition you must pack in cellophane, but many companies do package chips in glassine or foil (102-103). Other transparent films are not the only substitute for wrapping products that are ideal for cellophane, except in the sense of the particular package using cellophane, for NBC can and does sell a great many varieties of products simultaneously in a cellophane package, in cartons, and in printed wrappers (74).

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Visibility is of prime importance in wrapping cakes and sweet goods, and NBC uses cellophane for eye appeal and impulse buying, the eye appeal being ability to see the product (69, 95-96). For these, waxed paper would not be suitable, and glassine would give less visibility. For products that have to be wrapped in cellophane, Mr. McCurry did not believe there was any substitute for cellophane from a sales standpoint (69-70).

Cellophane's moistureproof quality helps considerably in merchandising. It also has luster, brilliancy, and transparency eye appeal (70-71). Foil has eye appeal of luster and flash, and NBC would be using it if it could afford it (71-72). Printed wax paper and glassine have eye appeal, but less than cellophane (72). Printed sulphite paper has eye appeal that sells products better than glassine or wax paper. It is not transparent (72-73). With products now

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wrapped in cellophane, and considering effective merchandising, Mr. McCurry felt that cellophane has greater display value than transparent or semi-transparent wrappers for those particular products (73). On products Mr. McCurry feels should be wrapped in cellophane, if competition is wrapping the items in cellophane, NBC must also do so to sell (83). However, this was not the reason NBC paid premium prices for foreign cellophane. That was due to seasonal demand for some NBC products sold in cellophane packages, when consumption of cellophane would (24)
exceed its allocation. To sell these items it needed to pack them in cellophane, and neither glassine nor waxed paper would do the same job (83-84).

NBC uses waxed glassine principally as a liner inside a carton which has an outer printed sulphite wrapper, and for sample bags. It has not used cellophane as an inner wrapper because of cost (93-94). Transparency is an important feature of cellophane which is of no use in an inner wrap, though the Sales Department insisted it would be in the fractional pack (94-95). Whenever NBC uses cellophane it is seeking moisture protection, and visibility also counts a lot (95-96). NBC's fractional package, which has no element of visibility, has been a success, and cracker sales have increased with its use (105).

(1)

NARRATIVE SUMMARY OF DEPOSITION OF DONALD RAMSAY

Taken January 25, 1952 at Manchester, N. H.

Donald Ramsay, who resides in Nashua, New Hampshire, is a Vice President and Director of Nashua Gummed & Coated Paper Company of Nashua, New Hampshire. He has been a Director for approximately eighteen years. He testified pursuant to subpoena (3).

Nashua Gummed & Coated Paper Company ("Nashua") was organized about 1904 (3, 30) and manufactures converted paper products and gummed cloth. Consolidated sales for 1938 were approximately $6,800,000; for 1948, $20,800,000; for 1950, $21,900,000 (3-4). Sales of flexible packaging materials are approximately 65% of total sales (4-5). Consolidated sales include sales by the mill in Nashua, N. H., by the Canadian Nashua Paper Company and by Nashua Package Sealing Company (4-5).

Nashua does not manufacture base paper (30). It sells the following flexible packaging materials: paraffin waxed paper, waxed glassine, other glassine products, cellophane, Pliofilm, polyethylene, cellulose acetate and converted paper products (5).

Nashua is one of the major wax paper producers. It sells both dry wax paper, which is paper impregnated with paraffin wax, and wet wax paper, which is paper coated with wax on one or both sides (5-6). Nashua makes approxi-

(2)

mately 150 types of waxed paper, to meet special require-

ments dictated by its customers. Nashua will make a type not in production at the moment on an order of 2½ tons, which is not considered a large order (6). Processing of paper has been Nashua's principal business since its formation (31).

Waxed paper was the dominant flexible packaging material in 1924, and still is today (7). Its price per pound is approximately 75% less than that of transparent materials, including cellophane (64-65). Waxed paper is an economical self-sealing type of package that requires only heat (51).

Nashua began converting cellophane in 1937. It decided to do so to broaden its market as it felt cellophane could be sold in some instances where waxed paper could not (31). Nashua commenced converting Pliofilm approximately ten years ago because some customers wanted it as a wrapper. Nashua began converting polyethylene and cellulose acetate for the same reason (40-41). It has never sold cellophane as received in roll form from the manufacturer without printing or converting it, except that when it has some off cuts that it wants to move out or for which it has no use, it disposes of them with no idea of profit (59).

Although Mr. Ramsay is not concerned with purchasing, he believed Nashua had purchased cellophane continually both from du Pont and Sylvania since 1937 (32-33). (3)
Nashua also has used Olin cellophane, and found it good cellophane (30, 33). Nashua has not considered purchasing cellophane from foreign producers. Mr. Ramsay knew nothing of the price of such cellophane, except that customers had told him what robbers the foreign producers were (59-60).

Nashua's operations are divided into eight divisions, including the Waxing Division and the Specialty Printing

Division (33). There is a single Specialty Printing Division from the standpoint of books and profit and loss statements by Division. For recording sales by months, however, the Division is sub-divided into "Film" and "Other". The use of subdivisions in sales reports is for Nashua's own benefit in production control (39).

The subdivision known as "Specialty Printing—Other" produces printed glassine, overwraps for toilet tissue and paper towels, and all paper products of a special nature on non-transparent materials (34-35). The subdivision known as "Specialty Printing—Film", converts all transparent films (35).

The Waxing Division covers waxed paper products, including bread wrappers, confectionery papers, sugar papers, razor blade wrappers, chewing gum wrappers, soap wrappers, wrappers for tobacco products and florist tissue (34).

Nashua sales of converted cellophane are approximately 5% and of other converted films about 3% of total sales (4)
(40). The Specialty Printing Division sales were estimated at 11% of total Company sales of which 8% were "Film" and 3% "Other" (37-38).

Mr. Ramsay estimated that 35% of total Company sales would be in the Waxing Division (35). He was not familiar with information sent by Nashua to the Department of Justice or Robert Heller and Associates, but knew it had been sent (34-36). He estimated that on a square inch basis Waxing Division sales might be 88% of Company sales (36). In response to a question as to what percentage of Waxing Division sales were for use as a white bread wrapper, he estimated 35% of Company production (36-37).

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The estimates by Mr. Ramsay of sales and percentage of sales by divisions were as of the year 1951 (65).

Approximately 85% of Nashua's flexible packaging products go into packaging in units for consumer purchase, and 75% of Nashua's sales of these products go to end users, 25% to converters (6, 25).

Nashua's packaging products go to a number of different end uses, and the Company frequently sells more than one of its packaging products for the same end use (6-7).

For the uses stated below, Nashua sells the flexible packaging materials listed after each use. Competition is severe for the underlined uses.

(5)

Use	Material Sold
Bread	Wax paper, cellophane, glassine
Crackers, Cookies and Biscuits	Paraffin wax paper, cellophane, glassine
Candy	Wax paper, cellophane, glassine
Chewing Gum	Wax paper, cellophane, glassine
Frozen Foods	Wax paper, cellophane, Pliofilm
Potato Chips, Popcorn, Snacks	Glassine, cellophane
Fresh Produce	Pliofilm, cellophane, polyethylene
Nut Meats	Cellophane, glassine
Dairy Products	Wax paper, cellophane
Tobacco Products	Cellophane, wax paper, glassine
Textiles and Hose	Polyethylene, Pliofilm, cellophane, glassine
Razor Blades	Wax paper, cellophane
Sugar	Wax paper, coated sulphite (7-11).

Of these uses the more important outlets for Nashua's products are bread; candy, frozen foods, gum, nuts, textiles and hosiery, razor blades, sugar, crackers, cookies, and biscuits. Relatively less important outlets for Nashua's products are potato chips and snacks, fresh produce, dairy products, and tobacco products (9-10).

So far as Nashua is concerned, the material that dominates each end use is indicated below:

(6)

End Use	Dominant Material
Bread	Wax paper
Candy	Wax paper
Chewing Gum	Wax paper
Potato Chips and Snacks	Cellophane
Crackers, Cookies and Biscuits	Wax paper
Frozen Foods	Cellophane and wax paper about even with the latter catching up fast
Razor Blades	Wax paper (11).

Nashua's market is principally the printing market of wrappers for bread, cookies or anything of a converted nature (62).

Cellophane competes with other flexible packaging materials sold by Nashua, and also competes with other packaging materials that Nashua does not produce (30). For example, Nashua's flexible packaging materials compete with Eastman's acetate film, with vegetable parchment, and with foil (14-15, 61). Nashua does not necessarily

give preference to cellophane; it all depends on the requirement and the use. Nashua tends to sell films over glassine, but not because it has competitors who are also converters of glassine (61).

Some converters compete with Nashua in the waxed paper field and some in the conversion of cellophane. Nashua has competitors for its coated papers, which are a flexible (7)
packaging material, another set of competitors in the waxed paper field, another set in the transparent field; some competitors are integrated to manufacture both waxed papers and transparent materials (64).

From Nashua's point of view the end uses for cellophane are not separate and distinct from the end uses of other flexible packaging materials. Similarly, the customers and prospective customers for cellophane are not separate and distinct groups from the customers for other packaging materials (13-14).

There is not one specific group of end uses for waxed paper alone, another specific group for which only cellophane is used, and another specific group for which only glassine is used. For any product, almost any type of flexible wrapping material can be used if the user is willing to sacrifice protection, appearance and sales appeal. Penny caramels could be wrapped in newspaper, but would have no protection or appearance. Ordinarily two or more materials are used to package the end uses for which Nashua sells its products. Sometimes this is by the same customer, and sometimes by different customers (71-72).

Certain things make one wrapping material more desirable than another for wrapping certain products. For an

end use wrapping materials are interchangeable, but there is (8) a selection as to which is the best for a purpose. It depends on the end use and the customer may use material that is better suited for the end use (63).

Customers may differ as to what they consider to be the proper wrapper for a particular product (69, 78-79). To one, visibility might be all important, to another, protection. This is not determined in large part by the particular product, but by the customer's choice (78-79). If the product is such that visibility would be a poor sales point, the customer would probably select a non-transparent wrap. Another customer with a product he believes he can show to better advantage if the customer can see it might decide to use a transparent wrap (79-80). Whether a customer with a product on which there is a low margin of profit would select a comparatively cheaper wrap depends on what the margin is. Bread is a low profit margin product, yet transparent materials are used for wrapping white bread and other economical things are also used for wrapping it (80). Mr. Ramsay had heard that there was greater margin of profit on variety breads than white breads (80).

Generally speaking, there is a specific wrapper better suited for the wrapping of each item (51). This does not mean that a specific material completely occupies that end use, since it is normal for two or three packaging materials to be employed for the same end use, and customers differ as to which is the best (69). Mr. Ramsay did not know why customers select a particular wrapper except to the extent of reading surveys on that question (51-52). Nashua sells one

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(9)

flexible material to a customer for a specific end use, and another material to a different customer for the identical end use. As the various materials improve or change in characteristics this is reflected in shifts of business for a particular product with a particular wrapper (69-70).

Many factors are involved in the determination of the wrap best suited for a customer's product and, although protection is one, certainly other factors enter into it (90). A customer may select a wrap because of display, protection or economy of production (43).

Assuming a customer was considering cellophane and glassine as a wrapper, since cellophane is at least equal to glassine in protection, the determining factor might be economy, as in the case of a candy bar wrap. In other cases, it might be transparency (90-91).

In selling converted glassine, Nashua stresses economy and greaseproofness. In selling waxed paper, it emphasizes economy, protection, opacity, clarity of design reproduction, ease and wide range of selection of the type best suited for the customer's needs (16). Nashua emphasizes the opacity of waxed paper for all products that are displayed for eye appeal, especially bakery goods, confectionery items and frozen foods. The more opaque a material is the better the printing looks on it (16-17).

Nashua's waxed paper wraps have eye appeal; and the eye appeal of such wraps is a major selling point. This is true of most of Nashua's printed products (73).

(10)

Nashua does high quality multi-color printing which sells at higher prices than similar products with less expensive printing. Nashua sells such high cost printing by creative selling, which means improvement of packaging.

This might benefit the customer by a high fidelity printed reproduction of his product. In selling such printing, Nashua emphasizes eye appeal, counter display and brilliancy. This is the same sales approach as that Nashua makes when it sells converted cellophane (15-16).

Waxed paper has been improved because cellophane was being sold for uses formerly served by waxed paper, in order to win back a position in those same uses (19-20, 71). The waxed paper industry could see the inroads that new products, such as cellophane, Pliofilm, other transparent materials and glassine, might make into waxed paper sales. The improvements were made to maintain waxed paper's volume of sales (54-55). These recent improvements in wax paper include greater opacity, superior coatings and progressive advancement in reproduction and printing, and they helped waxed paper maintain its volume. They had a part in displacement of cellophane in frozen food packaging. Most of the current displacement in that field is by a new tightly sealable type of wax paper, which Nashua calls "Enamalock" and Marathon calls "Tyton" (13, 19, 74). Nashua now uses less cellophane than formerly for frozen foods, due to the success of the new wax paper (74).

The development of cellophane has not hurt the growth (11)
of the waxed paper business, but has assisted the normal growth of packaging materials in which waxed paper played its part. The growth of cellophane sales has not had an impact on the volume of sales of waxed paper, but the new wax paper has affected cellophane sales (74).

There has been a sharper increase in packaging material sales as a whole since 1945 than in any other five to seven

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year period, due to consumer acceptance of pre-packaged goods in consumer unit size (21). The improvements in packaging machinery played a part in the increase by labor saving, through automatic production (21-22).

85% to 90% of Nashua's converted cellophane is moistureproof. Nashua would not have much cellophane volume if only non-moistureproof cellophane were available since the market for non-moistureproof cellophane is limited (18). In most of Nashua's sales, moisture protective quality is essential, and most of its flexible packaging products have a moisture protective quality (19).

As to the relative moisture protection of cellophane, glassine and waxed paper, laboratory tests are necessary for an authoritative answer. Mr. Ramsay rated moistureproof cellophane very high on moisture vapor protection, much better than untreated glassine (89-91). Moistureproof cellophane does not have greater protective value than any waxed paper produced by Nashua. Nashua salesmen sell waxed paper as having better protective value (72).

It makes little difference to Nashua whether cellophane is fibrous or not. For certain requirements it is important (12)

to have a fibrous material (70-71). Nashua may emphasize whether a material is fibrous or non-fibrous, depending upon the end use. Whether a material is fibrous is mentioned partially for flexibility and partially because fibrous material will make a more permanent seal (17-18). Paraffin wax is a poor adhesive, and works better when the material has exposed fibers to which the wax can cling, as compared with a fibrous material which is calendered so that the fibers are lying down. Also, some products, such as salt water taffy,

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require a wrap with relatively long fibers, and the sulphite paper must have long fibers and grain to be suitable for such purposes (81).

Wood pulp, cloth, waxed paper and glassine are fibrous materials (53). The term "plastic films" as used in the packaging field means chemicals from minerals, and includes acetate and Pliofilm, but not cellophane (54).

Individual sheets of Pliofilm and cellophane are quite alike in transparency, but both can be readily differentiated from polyethylene, which is inclined to have a cloudy background (49). Transparency is an important consideration in wrapping some frozen products and not as to others, because of the attractive reproduction that can be made on opaque waxed paper (78). Nashua's production of a type of waxed paper that is somewhat transparent is very small (91).

Nashua sells some waxed paper to a converter who makes it into a Revelation wrap, consisting of two outside strips of waxed paper and a middle strip of cellophane. (13)

The wrap is used principally for wrapping products that may have a sales advantage through transparency. Bread is an important outlet for it (25-26). Mr. Ramsay believed the cellophane window in the Revelation wrap is used for visibility (57).

The ability of a converted packaging material to be used on high speed packaging machinery is important to its sales. All Nashua's flexible packaging materials can be so used. Wrapping machinery has not been developed to accommodate all the packaging materials Nashua makes, but the trend is to automatic machinery. Waxed paper, glassine,

cellophane and sulphite paper operate readily on automatic packaging machinery, while Pliofilm, acetate, polyethylene operate somewhat less readily (22-23, 55-56, 72). Polyethylene is not difficult to heatseal (78).

The ability of a material to print well at high speeds is important to a producer of converted packaging products. Waxed paper is easier to print than cellophane. Waxed paper, cellophane and sulphite paper print well at high speeds, and glassine not to the same degree. Pliofilm, acetate and polyethylene are much lower in this quality (23, 73). Nashua's rotogravure process and aniline presses are used to print both glassine and cellophane (20-21).

Nashau has an executive whose entire job is to contact producers of packaging machinery, and to recommend the best packaging material for a particular use. He determines what to recommend in cooperation with the user, and assists in the choice, but in the last analysis the decision rests with (14)
the customer (55-57). One customer may prefer visibility over some other characteristic, and another may prefer greater protection. The price of the wrapping material is very important in the choice of material (56-57). If Mr. Ramsay were the producer of an article with a small margin of profit, he would select a cheaper wrapping material rather than a more expensive one (57).

In selling Nashua's products it is necessary to provide protection for the products to be packaged. Each of Nashua's packaging products as applied provides satisfactory protection (12). In packaging individual customer units of frozen foods, the recent trend is towards waxed paper because of improvements in coating. Also, waxed

paper can now be printed with multicolored reproductions of the product itself that make an attractive package. There is a tendency that waxed paper gives better protection to frozen foods than cellophane, and it certainly makes a more compact sealed package than cellophane due to the modified coating. The waxed paper is used as an overwrap and is displacing cellophane for that purpose (12-13, 74). The displacement is due to economy, better keeping condition under freezing, less trouble in wrapping, and greater speed in operation (77-78).

Nashua sells waxed paper, cellophane and glassine wraps for breads (66). Its dollar sales of these materials for that use are approximately 85% waxed paper, 14% cellophane and 1% glassine. Nashua commonly sells cellophane wraps and waxed paper wraps to the same customer for wrapping (15)
bread, but possibly the bread wrapped contains different formulas (66; 76). Waxed paper wrappers are used principally for white bread. Cellophane bread wrappers are used principally for specialty breads such as rye, whole wheat and cracked wheat, although considerable cellophane is used for wrapping white bread (41, 62). Glassine wrappers are also used for both white and specialty breads (41). In the packaging of crackers, cookies and biscuits, Nashua's waxed paper is sold both as an inner liner and as an overwrap. Many common crackers do not require an overwrap, but a waxed glassine (41-42). A particular customer might use cellophane or other transparent materials instead of wax papers or glassine for wrapping crackers, cookies or biscuits because of transparency, for counter display of inexpensive retail packages (42).

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In Mr. Ramsay's opinion, the reasons for using cellophane on white bread are eye appeal, appearance of package, and something different to take business from competitors. In one area in Pennsylvania, the majority of bakers use cellophane for wrapping white bread. Mr. Ramsay believed this was because where one baker by using a more expensive and different style of package can make inroads in the market, others take steps to meet the competition. He felt transparency was an important consideration (62-63). Not all the bakers continued to use cellophane; some reverted to the use of waxed paper (73).

Packaging of fresh produce is relatively a recent development. It was originally packaged in transparent bags, which (16)

Nashua does not make (45, 68). Printed cellophane is used as a window or an overwrap for small packages of tomatoes and apples in boats, both Pliofilm and cellophane for packaging celery, and Pliofilm and polyethylene for packaging spinach. Polyethylene is usually used in bags or sheets because it is difficult to print in roll form. The trend, however, is to Pliofilm and polyethylene because of their longer life and less shrinkage (45, 68).

The advantage of polyethylene as a bag for fresh produce is that it can be sealed or tied by itself. Cellophane can be readily used on fresh produce that sells quickly because, although it has a tendency to shrink and become brittle, it will not have time to do so on items that are sold quickly. For such items it is suitable and less expensive than Pliofilm or polyethylene (46). Mr. Ramsay believed Pliofilm and polyethylene are superior to cellophane for wrapping fresh produce (76-77). His personal experience is that cellophane

has a tendency to cloud when used as a bag for fresh produce (77).

Waxed paper is not good for wrapping fresh produce because it lacks flexibility and strength and has no suitable means of seal, and hence is not used widely for this purpose (52, 83-84). It could be used as a box overwrap for such things as tomatoes, but the hermetic seal might be dangerous to the product. There would be no visibility, but there could be a fine design in multi-colored rotogravure printing that would be helpful in package presentation (52).
(17)

In the past Nashua sold substantial quantities of cellophane for wrapping sheets and pillow cases (48). Cellophane is not a proper wrap for sheets and pillow cases because of the long period between packaging and sale (46). After some experience, in which cellophane was found unsuitable, Nashua went to Pliofilm because of its longer durability. Pliofilm eventually proved unsatisfactory and the next step was to polyethylene (48, 68). It is used for larger packages and for packages which require long keeping. Cellophane is still used extensively in envelope and sleeve form for hosiery, underwear and other small textile items (48-49). Waxed paper is not suitable for textiles because it will impart grease and might spoil the product (49). A band of sulphite paper is used as a wrap for textiles, and does not discolor them (88). In the textile and hosiery field, the important factors today are long shelf life, cleanliness and visibility. Transparent material is preferable for visibility and inherent cleanliness. Polyethylene is preferable for long life, but has a disadvantage in transparency (49).

Nashua sells wraps of waxed paper and of cellophane for penny candy items such as caramels. Overall, penny

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goods are a high profit item (42, 66). Waxed paper is also used in candy for protection and economy in lining such things as cough drop boxes where transparency is not essential, and in overwrapping larger packages, the shipping type of 5¢ and 10¢ packages (42-43). Nashua's glassine wraps for 5¢ candy bars are usually used over an inner liner of tissue which protects the candy, and avoids grease spots on the outer wrapper (66-67). Economy, greaseproofness and (18)
color display by design account for glassine's extensive use on the 5¢ bar (42). Mr. Ramsay had never heard any complaint that cellophane was a poor wrapper directly next to chocolate because of a tendency to smear (43).

In referring to the use of various packaging materials in the bread field, candy field or the textile field, Mr. Ramsay was speaking of the field as a whole rather than individual items within it. By individual items there might be a particular wrap which is far superior to any other type (81-82). However, waxed paper and cellophane are both used on the same specific products within general fields. For example, both are used on white bread, on crackers, on penny candy and on candy kisses (88).

Nashua packaged its doilies, napkins, paper cups and paper tablecloths in cellophane at one time. Cellulose acetate, which costs more, replaced it because of flexibility, longer shelf life, and less shrinkage (14, 52-53).

In chewing gum, waxed paper is used to wrap individual sticks and for overwrapping five, ten and fifteen pound cartons. Cellophane could be used as the wrapper for these cartons, but would not be good because of its tendency to break. In such a large carton, display and transparency would not be important (44). Completely overprinted cello-

phane is used as an opaque overwrap for the 5¢ package of five sticks (44). Waxed paper could be used for the same opaque wrapper, although Mr. Ramsay knew of no case where it is. Prior to the use of cellophane, the gum overwrap was a lithographed sulphite paper (67-68). Laminated glassine is also used as an overwrap for the 5¢ package of chewing gum, replacing foil (44).

(19)

In the wrapping of cigarettes, part of the package is sulphite paper and part is cellophane (81). Nashua also produces sulphite wrappers for chewing tobacco (70). Cellophane and some glassine are used for individual wrapping of plug tobacco. During the war when cellophane was short, Nashua supplied waxed paper for this use (47-48). Plug chewing tobacco does not have an appetizing appearance and transparency is not a great asset in that application. A well printed wrapper is a better selling approach for plug tobacco than unprinted cellophane or any unprinted material (70). Waxed paper is used as a liner for canned tobacco, and glassine as an overwrap for tobacco cans (48).

Sugar is wrapped in coated sulphite. Cellophane would be equally as good for individual packages of sugar for restaurants if the sugar people wanted to go to that expense of display. Cellophane would hold the weight of sugar without breaking as an overwrap on pound packages (50). Waxed paper is rarely used for granulated sugar, but is used for powdered confectionery sugar for moisture protection (51).

Waxed paper treated with a rust inhibitor is used in direct contact with razor blades and cellophane as an overwrap for the individual small package. The materials are used for different purposes (50).

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For packaging nut meats, cellophane is used principally; but nut meats are also packaged in glassine, tin cans, and glass jars (46-47).

(20)

In dairy products, waxed paper is used as an overwrap for brick ice cream in a new type package that keeps ice cream longer. This is having rapid acceptance, thereby improving waxed paper sales. Cheese and similar products are wrapped in cellophane and other transparent materials (47).

Nashua does not urge waxed paper as a wrapper for some products, such as ball bearings, toys and other packages of that type. It would be useless expense to use waxed paper rather than a cheaper wrapper. Waxed paper is not recommended for textiles and hosiery because of the possible penetration of grease, and is not used for nut meats because they are usually sold in bags. Waxed paper bags are unsuitable because of lack of permanent seal (82-83). For the same reason, waxed paper is not used for potato chips and also because a degree of transparency is necessary. Much laminated glassine is used for potato chips. It is transparent, has fine protective qualities and is easy to print. Usually potato chips bags, whether of glassine or cellophane, have a very heavy coating of ink and only partial transparency. Generally speaking, the manufacturers are more interested in protective qualities than in transparency, and consider the flash of the ink colors important to give the package display value. There is eye appeal to a package in addition to transparency; a different type of eye appeal (83).

Nashua tries to get as much eye appeal with waxed paper as possible. Cellophane has an advantage in transparency,

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flash and gloss, which Nashua constantly fights, but waxed (21)
paper has advanced so much that today many packages in waxed paper have such shine and gloss that so far as eye appeal is concerned, cellophane's only advantage is transparency (84). Other advantages of cellophane compared to waxed paper are flexibility, light weight, greater yardage and ability to be formed into bags (84). Waxed paper is more likely to collect dust as a wrapper on a shelf than cellophane (84-85).

Mr. Ramsay did not know what importance impulse buying has in today's consumer market, since Nashua's place in it is not important. He understood that in self-service stores meats and other products are wrapped in unprinted cellophane, but regarded that as the cellophane consumer's market and not Nashua's market (61-62).

Waxed paper is a general term that covers many special types of wrapper (87). Each type of Nashua's waxed paper has distinct characteristics as to protection or strength (74). Producers of cellophane also offer a variety of types of moistureproof cellophane, such as heatsealing transparent, heatseal anchored coated transparent, and various subtypes of each of these. Each variety has special characteristics. Non-moistureproof transparent cellophane and all moistureproof types have distinctly different characteristics. Waxed paper and cellophane are separate and distinct products (63). The different characteristics of different types of waxed paper are in the same class as the differences between waxed paper and cellophane, although the characteristics of cellophane are quite different from waxed (22)
paper as a whole. Differences in types of waxed paper are

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not as broad, but are substantial. Nashua has grades of waxed paper that are transparent and have high gloss, such as double waxed paper and waxed glassine. It also has other grades of very heavy weight with 75 pound base and 125% paraffin, or double the weight of the paper itself (85-86). The differences in the types of waxed paper are in converted construction of the base commodity (86). Cellophane and waxed paper are both made from wood pulp, but in general appearance there is a wide difference in the two products (86-87). Pulp is treated in one way to produce cellophane and in a different way to produce paper. Paper products require so-called dissolving pulps (87).

In the selection of a wrap by a customer the choice depends on the balancing of price, protection and display rather than on any one all important consideration. Some customers will disregard display and protection for price, but not often will a customer disregard protection. Depending on end use, one customer may consider eye appeal the greater consideration, while another may consider protection. Even for the same end use, one customer sometimes has one consideration more in mind, and another customer has another consideration more in mind. That is what makes competition (89).

Du Pont has not tried to control what products Nashua makes from cellophane, in what geographical areas Nashua sells, or the prices it charges (28-30). Du Pont does recommend certain types of film for certain products as a super-

(23)

visory service that is helpful (29). If Nashua chooses to use a film outside the recommendation, it feels it is taking an unjustified risk. For example, du Pont recommends one

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type for wrapping fish, and a different type for wrapping paper cups (58-59).

Just as du Pont suggests types of cellophane for particular applications, Nashua recommends to its customers specific types of waxed paper for particular applications (72-73).

In promoting its products, Nashua uses advertising by direct mail, salesmen, technical research, and development of machinery, both in its own Company and with packaging machinery manufacturers (26). The same methods of promotion are used for cellophane and for Nashua's other packaging products (27). In certain areas, Nashua salesmen will specialize on two or three products, such as cellophane, glassine and sulphite, or waxed paper or gummed products, and in other areas one or more salesmen will handle all the Company's products (27).

Nashua has received from du Pont periodic lists of the names and addresses of all du Pont cellophane salesmen, copies of advertising and results of market surveys (27-28). Nashua salesmen and du Pont salesmen make joint calls on prospective accounts. Such du Pont commercial service is a valuable sales tool that Nashua uses to its advantage (28). Commercial services Nashua receives from du Pont are more frequent and of greater value to Nashua than those it receives from other suppliers. Nashua receives some commercial services from Sylvania, but those of du Pont are outstanding (28). Ramsay did not know whether (24)
or not Nashua had a converter agreement with du Pont, or whether it received an advertising allowance or other discount as a converter (31-32).

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Waxed paper and glassine were in short supply in the period 1941-1951 except for a period of about a year from 1949 to June, 1950 (23-24). Although approximately fifty companies produce waxed paper in the United States, the shortage of waxed paper in 1946, 1947, and until June 1949 was general among those companies (24, 65). The supply became tight again in June, 1950, but currently is more free (24). The shortages were due to scare buying, demand, high inventories; the interplay of supply and demand (24-25).

Nashua is now getting all the Pliofilm, glassine, waxed paper and cellophane it wants, but not all the polyethylene. The glassine market is tight today, but it can be purchased (60). The Company's consumption of these flexible packaging materials has increased since 1945, and its use of polyethylene started since 1945 (74-75).

Cellophane is in free supply today, although Nashua is on allocation (60). Cellophane has generally been in short supply from 1941 until about October 1951, although there have been periods when cellophane was fairly free for a few months or so (60). Nashua has been getting all the cellophane it wants for the last four or five months (60, 63-64).

(1)

NARRATIVE SUMMARY OF DEPOSITION OF ROY E. HANSON

Taken February 13, 1952 at Chicago, Ill.

Roy E. Hanson of Milwaukee, Wisconsin is Vice President and Director of Sales of Milprint, Inc., Milwaukee, Wisconsin. He has been in sales, advertising and promotion work during all of his thirty-two years with Milprint (91-131).

Milprint is a substantial converter of flexible packaging materials. Its business is about half of that of Marathon, about equal to that of Shellmar and about twice that of Dobeckmun (129-130). Milprint's gross sales in 1951 were $50,700,000 compared with $1,500,000 in 1927 (134). Mr. Hanson estimates that 30% of Milprint's present dollar volume of business is in converting of cellophane (97-98, 167).

Milprint, Marathon, Shellmar, Dobeckmun, Traver, Nashua, Crystal Tube and Daniels are some of the larger and more important converters who handle cellophane (204).

Mr. Hanson could not distinguish sharply between a converter and a fabricator, though he believed the former to be a processor of material and the latter one who makes manufactured goods (198-199). He is sure, however, that Milprint does not make straws, hat-trim, ribbons or cord out of cellophane (219-220). He does not know how du Pont defines the words "fabricator" and "converter" and would not attempt to say (227).

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(2)

When Mr. Hanson began working for Milprint, the Company was a general printer. Prior to that time, however, Milprint had gone into packaging in a small way by printing candy bar wraps from glassine. Milprint's converting business grew from that point to its present scale, at which 85% to 90% of its total business is converting for packaging (92-93).

In addition to cellophane, Milprint converts glassine, sulphite, greaseproof paper, vegetable parchment, waxed paper, cellulose acetate, Pliofilm, polyethylene, Saran, aluminum foil and numerous combinations of these materials (93-94, 168-169, 225-226). Mr. Hanson estimates that Pliofilm and acetate each have accounted for about 1% of Milprint's business, and polyethylene between 1% and 2% (168-169).

Mr. Hanson attributed Milprint's growth to all its products, not to cellophane conversion alone (208).

Milprint combines waxed paper with other materials in printed form for wraps for baked goods (94).

Milprint converts glassine for wraps for candy, meat, macaroni, ice cream bars and potato chips (94-95, 200). To the potato chip trade Milprint also supplies cellophane, aluminum foil, cartons and Pliofilm (110-111, 204). Flexible wraps compete with cardboard cartons (205).

Milprint buys its supply of glassine from the Nicolet Paper Co. (a wholly owned subsidiary), Rhinelander Paper Co., Thilmany and others (131-132).

(3)

Vegetable parchment wraps are converted by Milprint principally for oleomargarine, butter, meat packing and

macaroni (95). Cellophane was once unsuccessfully used as a butter wrap, but is not used for butter wraps at present (200-201).

Sulphite paper is converted into waxed paper for the baking industry and is used in combination with other materials for oleomargarine and butter. For other uses it is combined with aluminum foil. Mr. Hanson could not recall a converted use for sulphite used alone (95).

Milprint converts aluminum foil principally for candy, Government packaging, oleomargarine, butter, cheese, frozen foods and potato chips (95-96, 112). Foil, glassine and certain films compete in the wrapping of ice cream bars. Uses of foil in the candy industry include: candy bar wraps, box overwraps, and certain forms of bags (200). Milprint converts aluminum foil in laminated form, except for chocolate bar wraps in Army rations, where it is used unmounted (203-204).

Milprint converts cellulose acetate principally for the wrapping of fresh produce, paper goods (including greeting cards, paper napkins, tissues, etc.), Government packaging, small-unit packaging, and dehydrated products (in combination with another material) (96, 201). Milprint supplies both cellulose acetate and cellophane wraps to the textile (4)
trade for the wrapping of hosiery, underwear and flat goods (such as sheets and pillow cases). Cellophane has been found not to be a good wrapping material for flat goods (because of absorption of plasticizer) and is decreasing in that use, though it was once widely used (107). Milprint's flexible wraps compete for the packaging of textiles with cardboard boxes (204). Generally, Mr. Hanson believed that flexible wraps compete with cardboard boxes (205).

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Milprint converts Pliofilm wraps principally for the meat packing trade, for fresh produce wraps, candy (particularly small and hard candy) and textiles (96, 201). Milprint makes a Pliofilm meat-casing for meat loaves, called "Mil-O-Seal", which it sells against cellulose tubing of Visking, T-Pack and Sylvania (131).

Milprint converts polyethylene film principally for packaging produce, textiles, drug products and candy (96). U. S. Government use of polyethylene film has contributed to the present shortage of this material (226).

Milprint converts greaseproof paper for meat packing (as direct wraps for sliced bacon, certain meat cuts and hams, and as liners), candy, and ice cream wraps (97, 202). Sliced bacon was wrapped in glassine, greaseproof paper or parchment before the introduction of cellophane. Waxed paper, glassine, parchment, cartons and cellophane are all used today, as well as some non-flexible material (105).

(5)

For practically all of the above trades or uses for which Milprint converts other materials, Milprint also converts and sells cellophane to a great or lesser degree (97).

For the baking industry, Milprint supplies two types of bread wraps, an all cellophane wrap and a "Revelation" wrap, a combination of waxed paper and cellophane. Waxed paper is the most widely used wrap in the baking industry, and Milprint sells its two types of bread wraps competitively against waxed paper bread wraps converted by Marathon, Fabricon, Waxide, Poliock, Zimmer and Western Waxed Paper Co. (108-109).

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Wraps presently in use for cheese are wax-coated cellophane, Pliofilm and aluminum foil. Milprint makes a cellophane cheese wrap of MAT stock heavily coated with wax, similar to that made by Marathon Corp. for processed cheeses (105-106, 133). Milprint does not supply a similar wrap to the meat trade, since there is no demand for it of which Mr. Hanson is aware (133). Milprint converts foil for cheese wraps in competition with Reynolds Metals Co., Alcoa and Traver (106, 112).

For the frozen food industry, Milprint converts and sells principally aluminum foil and printed opaque cellophane carton overwraps. Nearly all cellophane frozen food wraps are opaque. The latter type of wrap has been used in the industry for the last ten years. Waxed paper has gained great acceptance recently as a frozen food carton overwrap, at great expense to cellophane; in fact it is practically obliterating cellophane. Of these waxed paper (6) wraps, Marathon is the largest producer (109-111, 225). Their acceptance is owed to the fact that they afford protection and eye appeal equal to cellophane at considerably lower cost. Low cost, rather than visibility, is important in this industry (202).

The above uses of Milprint's flexible packaging products cover the principal uses, but is not exhaustive (96).

When du Pont started developing a converter business, cellophane converting was a new art. There was a converting business already in foil, glassine and waxed paper. Far from du Pont selling exclusively to larger converters, Dobeckmun and Shellmar were not even in business when du Pont started. Compared to Milprint, the waxed paper converters were large (217-218).

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Suppliers of all flexible packaging materials used by Milprint try to find new applications, and new converted forms and uses for their materials. Their merchandising methods are aggressive in varying degrees, the cellophane suppliers being, perhaps, the most aggressive (118-119).

Saran, Pliofilm, aluminum foil, cellulose acetate, and polyethylene are more expensive than cellophane. Parchment, glassine, greaseproof paper, waxed paper and sulphite are cheaper, the cost of these materials in converted and un-
(7)
converted form being in descending order, as above. As Milprint converts it, foil is combined with other materials, and the price of the combination will vary with the other material (102-104; 136-138).

The gauge of foil most widely used by Milprint is .00035 (104). Lamination of .00035 foil may actually decrease the cost per square inch as against heavier foil, used alone (137). Cellophane is probably superior in moistureproof properties to non-laminated foil of .00035 gauges, such light gauge foil requiring a lamination to give good moistureproof protection (137). Wax-mounted foil is superior to moistureproof cellophane in resistance to moisture vapor transmission (220).

Waxed paper gives moisture protection roughly equivalent to moistureproof cellophane. This is a working standard of comparison relied upon by Milprint in its business (138).

Cellophane is a transparent film, more transparent than Pliofilm, polyethylene and Cry-O-Vac, but not more so than acetate or Saran (165). Pliofilm is flabby to some degree in heavy gauges and when stretched (165). Waxed paper, sulphite, glassine, and vegetable parchment generally are non-transparent, though some forms of waxed paper and

glassine are known as translucent (165-166). Cellophane's transparency is a feature distinctive from non-transparent (8)
wrappers which sets it apart from these wrappers (167).

Cellophane has sheen, glossiness and luster (166).

Pliofilm's ability to shrink under application of heat sets it apart from cellophane (169).

Eye appeal is something that appeals to the eye (166). If properly converted, foil, waxed paper, sulphite, vegetable parchment and glassine all have "eye appeal". If they lack transparency, they have obvious differences from a transparent wrap. Cellophane is not always transparent, however (169-170).

Pliofilm, polyethylene, acetate and cellophane are available when a transparent wrapper is needed. Pliofilm runs less well than cellophane on machines, has a narrower heat-sealing range of temperatures and requires adjustments and attachments to a machine set for running cellophane. Polyethylene and Saran are quite difficult of machine operation, and polyethylene has a very narrow range of sealing temperatures. Acetate is getting easier to handle, but not as easy on machines as cellophane (170-171).

Mr. Hanson was certain that waxed paper, glassine, parchment, sulphite, aluminum foil, cellulose acetate, Pliofilm and greaseproof paper compete with cellophane. Each (9)
material is offered by its producers as available to users as wraps, in competition with cellophane. Each material has from time to time displaced cellophane, and vice versa, in certain end uses, and some of them are used in various end uses concurrently with cellophane. Differing characteristics

of the materials do not necessarily create exclusive markets for each (214-216). Milprint sells these materials for eye appeal, among other things, which is achieved by printing. Materials of different appearance may all possess eye appeal (216-217).

Major improvements in the quality of cellophane over the years have been the development of moistureproof cellophane, and the diversification of types of film for particular packaging applications. Diversification has opened up additional uses for converted cellophane and made it more successful (119-120).

Improvements in other flexible packaging materials have been made over the years (120-121). An example is the development of hard wax for waxed paper, which gives a smoother finish, greater resistance to rubbing off of the wax, and does not permit dirt to adhere as easily as formerly (121). These improvements and the developments of successful and attractive color printing processes have given waxed paper increased acceptance. An example is its excel- (10)
lent performance in the frozen foods industry (121-122).

The purpose or function of a package made of any material converted by Milprint is to provide a convenient unit of purchase, to protect the product wrapped against spoiling or pilfering, and to enhance sales of the product by making an attractive eye-catching package. Any successful package must fulfill this purpose (126-128).

Milprint advertises its packaging products by direct circulars and advertising in trade papers such as the Package Journal, Modern Packaging, Good Packaging, National Provisioner, Meat Magazine, Bakers' Weekly, Baker's Helper, International Confectioner, Confectioner's News,

Food Industries, Sales Management, Quick Frozen Foods (128-129).

When Milprint seeks large volume of business in an established but small market, its approach is to compete with an improved service, quality or price over those of the present supplier. Where the market is not established, Milprint calls in its trade specialists to analyze the limitations on packaging in the trade to which Milprint wishes to sell, its economics and other aspects, and to make recommendations as to the packaging materials that will do the job. These were the methods employed in developing sales of converted cellophane (112-115).

Milprint buys cellophane from du Pont and Olin Industries, about 9-1, respectively. Milprint bought substan-
(11)
tial quantities from Sylvania in 1938-1939, and smaller, but still commercial, quantities in 1948 and 1949. Milprint did not buy from Sylvania between 1939 and 1948 because Sylvania film did not give as good performance on converting machinery as did du Pont film (115-117, 211-212). Since 1949 Sylvania has not been available for sale to Milprint (115-117).

Milprint's sales force includes industry specialists, who concentrate on sales of packaging materials to a trade, *e.g.*, an industry specialist for meat. An industry specialist handles all Milprint's products and materials sold to accounts in a particular industry (98-99).

Some of Milprint's customers rely on Milprint for packaging design, or selection of a packaging material. Others decide these questions themselves (99-100). Milprint has a Products Development Department, with a lab-

oratory which can test the performance of different materials (100). If a customer insisted upon a specific wrap, Milprint would sell it to him even if Milprint thought it wrong for his product, but customers like General Foods and National Biscuit know as well as Milprint what wrap is best for a particular product (203).

The selection of a packaging material must account for the nature of the product to be wrapped, the type and degree of protection it needs, what the objective of packaging is, what type of machinery is to be used for packaging, public acceptance or tradition of a package of a certain type, and cost of the various materials (100-102).
(12)

Interchangeability between cellophane and other materials on converting equipment requires adjusting the machine, a simple or difficult matter, depending on the type of material and equipment involved (111-112).

Cellophane was in short supply during the war and afterward, until April 1949. During this shortage period Milprint either converted cellophane out of its customer's allocation from the manufacturer, or went to another material, which might not be entirely suitable for the purpose, or sold Revelation wraps (which are part cellophane) (171-172). Among other materials substituted were foil and papers. All materials were in rather short supply. Mr. Hanson cannot recall a specific instance where cellophane took back the business when it became plentiful again, though Mr. Hanson thinks a product formerly wrapped in a presently scarce material would generally go back to it when the material became plentiful again (172-174).

As far as Mr. Hanson knows, Milprint exports to Hawaii, Mexico, Puerto Rico, Venezuela, Australia,

Panama, Dominion Republic; hardly at all to Europe, where either dollars are unavailable for payment, or equally efficient converting facilities exist. Milprint has not exported to Canada, because of sentiment against American goods, high duty and the existency of equally competent converting facilities in Canada. Milprint does not export to Brazil, Hong Kong or Peru (205-207).

(13)

Milprint belongs to an association of about sixty-two converters, the National Flexible Packaging Association. Shellmar and Dobeckmun are members, Marathon is not. Prices are not discussed at meetings (148-149). This association was founded in Cleveland in October 1950 by a group of glassine bag manufacturers; Union Bag & Paper Co., Paramount Bag, Oneida Bag & Paper Co., Milprint, American Paper Goods Co., Kehr Paper Products, Columbia Bag Co. Its purpose was and is to compile statistics and set up standards for use by the industry and to facilitate informed presentations to the NPA and other Government agencies dealing with restrictions of materials. As the group was formed, other items were included. Within this association are eleven divisions, some of which are: Transparent Bag & Wrapper Group, Paper Bag Group, (excluding grocery bag), Plastic Group, Foil Group, Laminations Group (221-224). These divisions exist to facilitate reporting by products, and do not reflect segmentation in the market (247, 251). Waxed paper bags are comprehended by the association, but there already exists an association covering waxed paper as such, the Waxed Paper Institute. There used to be an association called the Flexible Packaging Institute, of which Milprint was not a member (148-149, 221-225, 246-247).

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The statistics compiled by the Waxed Paper Institute are compiled by the firm of Ernst & Ernst, Certified Public (14)
Accountants, who perform the same task for the National Flexible Packaging Association. Mr. Hanson has been shown their forms of report for the Waxed Paper Institute (247, 249).

Mr. Hanson recalled an investigation made of Milprint's files by the Government in late 1950, though he did not connect it at the time with visits of representatives of the Federal Bureau of Investigation (142-143). He is not familiar with the details of the investigation (153).

Mr. Hanson does not think Milprint could make a fair profit if it reduced its prices. He does not know what other converters' profits are. When asked what Mr. Hefter of Milprint meant by the word "chiseler" in a letter to Mr. Hanson of July 13, 1949 (shown him by Government counsel), he defined a chiseler as one who sells at a lower price than Milprint. He does not know whether they make money (194-195).

Mr. Hanson believes Milprint received a 7% or 7½% converter discount from du Pont, in addition to a 2½% advertising allowance in 1939. He could not recall when the figure for converter discount changed, nor the precise period when Milprint received a quantity discount. He does recall that Milprint received a quantity discount, however, based on total annual purchases, and believes that if the discount were graduated, it would be some advantage to Milprint to purchase from one source (138-140).

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(15)

Mr. Hanson does not recall the amount of converter discount extended to Milprint by du Pont prior to the time Milprint began buying Sylvania film, but he recalls that Sylvania extended a quantity discount in addition to a converter discount (210-211).

Milprint was once considered a promotional converter, but not at all times, and not at present. Milprint does not now purchase exclusively from du Pont (140-142).

Milprint has no contract with du Pont (221).

Mr. Hanson could not recall whether non-promotional converters could use the du Pont standard label, or whether fabricators could use it, though he assumes any du Pont customer could (149-150). Milprint was allowed to use it on du Pont material, and felt it was valuable (149). He recalls an advertising allowance once granted to Milprint as a promotional converter by du Pont, and Milprint's efforts to reinstate it after termination, but does not recall the date, or reason, for termination (150, 221). Milprint receives no advertising allowance from du Pont now (221). The allowance did not discriminate in favor of large converters who, like Milprint, have never had substantial advertising, compared with Marathon or Shellmar who do (151-152). This allowance was the only advantage Mr. Hanson can recall that accrued from being a promotional converter (152).

(16)

Du Pont has given Milprint sales assistance by the development of new applications for cellophane, but despite requests has not given substantial technical assistance from a manufacturing standpoint (122, 199, 231). If du Pont had loaned or recommended personnel to Milprint, Mr.

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Hanson would call that assistance, but he does not know of any such case (199-200). Milprint asked du Pont to conduct a training school for Milprint men, but du Pont did not (153).

Du Pont has never imposed territorial limitations on Milprint's sales (123), nor attempted to fix prices of Milprint converted cellophane products (131, 146, 154).

At one time Milprint sold cellophane stock bags of du Pont cellophane to Blake, Moffitt & Towne, West Coast sales agents for Sylvania. Mr. Hanson could not recall whether Milprint bought Sylvania cellophane from Blake, Moffitt & Towne, but Blake, Moffitt & Towne tried to have Milprint use Sylvania film to make its bags (123-124).

During the period in which Milprint bought film from Sylvania as well as from du Pont, Milprint used the du Pont label, at du Pont's request, on products made of du Pont film to distinguish them from products of Sylvania film. Milprint had used the label before, and continued to do so (125, 149).

During the period of cellophane shortage, Mr. Hanson believes that Milprint probably was treated fairly, although it agitated constantly for more film from du Pont, using

every method imaginable, and Mr. William Heller of Milprint wrote a number of letters to du Pont for this purpose. Mr. Hanson thinks Milprint was treated no better or worse than other customers, and that du Pont tried to be fair (125-126, 174). Du Pont has never favored Milprint as against other converters with a special price for cellophane, or in quality or volume of service rendered (132).

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Mr. William Heller, purportedly the writer or recipient of letters shown Mr. Hanson by Government counsel, is a co-founder of Milprint fifty-two years ago, and has been Vice President; President, and is now Chairman of the Board (250). At the time of Mr. Hanson's deposition, Mr. Heller was enroute to the Orient, planning to return the middle or end of May, having left about January 20, 1952 (132-133, 208).

Du Pont in 1949 made an adjustment with Milprint when du Pont reduced cellophane prices, which extended that price to Milprint for some of its unsold cellophane inventory bought from du Pont before the reduction. This adjustment recognized that Milprint's customers would insist on corresponding and simultaneous reductions in converted prices, including products made from film bought at the higher prices. It was not du Pont that forced Milprint's prices down on these occasions. Mr. Hanson would be surprised if this adjustment were not extended to any converter (192-193, 227-228).
(18)

Mr. Hanson did not doubt that Milprint was given an opportunity to buy 450 gauge cellophane from du Pont when it had an excess, but did not know whether other converters were extended the same opportunity (194).

Milprint volunteered to du Pont as a matter of interest a monthly report of quantities of cellophane received from other sources, but did not necessarily do it for other suppliers, such as Goodyear (since there was no other rubber competing material) (162-163).

During the term of a patent on Revelation wrap owned by Ramco Corporation, Milprint was a licensee. Mr. Han-

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son has no doubt that Milprint tried to prevent Pollock Paper Co. from also getting a license, for competitive reasons, but doesn't recall whether Milprint asked du Pont to assist in this effort. Letters purportedly from William Heller to E. C. Lake dated October 3, 1945 and October 17, 1945, and Mr. Hefter to Arthur Snapper (both of Milprint) dated September 20, 1945 did not refresh Mr. Hanson's recollection (195-197). A letter purportedly from Mr. Hanson to Art Snapper dated May 4, 1945, reminded Mr. Hanson that he was asked for an opinion with regard to this matter (197-198).

Mr. Hanson does not recall the details of Pollock Paper Company's seeking a license, although he recalls that some such situation arose. He does not have any recollection as to whether any action was taken in this matter by Mr. E. C. Lake of du Pont (228).

(19)

A letter purportedly from Bert Hefter to Mr. Hanson dated July 13, 1949 mentioned a "du Pont assistance program" of sales assistance to Milprint by du Pont. This was never an actual du Pont program, but rather a program suggested to du Pont by Milprint for the purpose of training salesmen and related functions. Du Pont never followed the suggestion, though du Pont had suggestions submitted for sales promotion from Shellmar, Dobeckmun and Milprint (153, 245, 248). This program was prepared by Mr. Hanson as the result of the only meeting Mr. Hanson ever knew of at which du Pont officials met with converters and discussed what markets should be approached. Du Pont met with Milprint, Shellmar and Dobeckmun at Wilmington and asked "What can and should we do to promote the use

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of cellophane?" Each converter had its own point of view on what du Pont should do (248-249).

E. C. Lake is not included with the term "our organization", which is used by Mr. Hanson to comprehend only Milprint people (245-246).

Mr. Hanson was shown on cross-examination a document purporting to be a letter from William Heller to E. C. Lake, dated September 9, 1946, containing the sentence: "Don't forget that Shellmar sets the roto prices." This refers to a Shellmar patent, in effect at the time on a process called "Colordense". Milprint was licensed under that patent, the terms of the license setting prices of rotogravure printed cellophane made under the license (146-148, 243-244).

(20)

No one but Milprint set Milprint's prices for unlicensed products (245).

In addition to documents mentioned above, Mr. Hanson was shown by Government counsel a number of documents, given Plaintiff's Hanson Exhibit numbers for identification, which purported to be communications from and to parties listed below with dates and transcript pages at which each was numbered by Government counsel:

Plf's. Hanson Exhibit No.	From	To	Date	Tr. Page
P. Ex. 1	Billeb	Shoen	4/10/45	146
P. Ex. 2	William Heller	E. C. Lake	8/30/45	154-155
P. Ex. 3	William Heller	E. C. Lake	3/10/47	155
P. Ex. 4	William Heller	Paul Hardison	3/17/47	156
P. Ex. 5	William Heller	E. C. Lake	3/24/47	157

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Plf's. Hanson Exhibit No.	From	To	Date.	Tr. Page
P. Ex. 6	William Heller	Zimmerman	3/29/47	158
P. Ex. 7	Hopkins	Hardman	10/ 3/45	160
P. Ex. 8	William Heller	Coumbe	5/15/46	163-164
P. Ex. 9	William Heller	E. C. Lake	8/28/46	164-165
P. Ex. 10	William Heller	E. C. Lake	12/29/47	175
P. Ex. 11	Hanson	Hefter, Rosen, Zimmerman and Grunauer	3/31/49	178
P. Ex. 12	Hefter	Hanson	8/ 7/44	182
P. Ex. 13 (21)	Heller	E. C. Lake	8/11/44	183
P. Ex. 14	William Heller	Hefter	8/11/44	184
P. Ex. 15	Hanson ?	Lake	4/18/46	185
P. Ex. 16	Lake	Hanson	4/23/46	185-186
P. Ex. 17	Rosen	M. T. Heller	4/23/46	186-187
P. Ex. 18	Hefter	Zimmerman	4/25/46	187
P. Ex. 19	Rosen	Hanson	5/ 7/46	188
P. Ex. 20	Zimmerman	William Heller	5/23/46	189
P. Ex. 21	William Heller	E. C. Lake	2/26/47	190
P. Ex. 22	William Heller	E. C. Lake	11/15/45	191

From Milprint's accumulated experience with Sylvania cellophane, of which Mr. Hanson is cognizant, he believes that Sylvania film does not measure up to du Pont film in machine-running properties. He disagrees with an opinion of Mr. Billeb appearing in Plaintiff's Hanson Exhibit 1 to the effect that Sylvania film ran well on bag machines. Mr. Billeb is Works Manager of Milprint, a qualified man, and more closely connected with plant operations than Mr. Hanson (144-146). Nevertheless, Mr. Hanson's opinion as to relative machine-running quality of Sylvania and du Pont

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cellophane was formed by contact with Milprint's technical men and with Milprint's customers, and his understanding is contrary to Mr. Billeb's opinion (211-212, 229-230). (22)

Du Pont never has had anything to do with Milprint's prices of converted cellophane, or agreed with Milprint on them, and du Pont never directed or dictated what uses for cellophane Milprint should or should not develop (146, 154). Three documents shown to Mr. Hanson by Government counsel refreshed his recollection as to the following facts: In 1945 du Pont did not want to promote the wrapping of white bread in cellophane, since it could not supply enough cellophane to satisfy a widespread use for that purpose. Milprint, however, sold cellophane at that time for use on white bread. On one occasion, Milprint reported to du Pont that W. Long, a bakery sales organization, was using cellophane to wrap white bread. These three documents were purported letters from William Heller to E. C. Lake dated October 11, 1945; Milprint to E. C. Lake dated October 15, 1945; Roy Steele to Roy Hanson dated October 25, 1945 (159-162). Du Pont's effort, except for white bread packaging in this period, was always to broaden use of cellophane. Du Pont did not comply with Mr. Heller's request in Plaintiff's Hanson Exhibit 2 that du Pont discourage the use of cellophane on white bread (217, 231). Du Pont did not dictate to Milprint on any occasion as to the end uses for which Milprint could or could not sell cellophane (217). (23)

Du Pont once made a study of the price at which the use of converted cellophane could be broadened in the baking industry to wrap all products, and concluded that if con-

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verter costs could be reduced to 15¢ a pound, the use of converted film could be extended to all types of bakery products. By March 1947, when Plaintiff's Hanson Exhibit 3 was written, converting costs had risen so as to make this figure impracticable. William Heller's reaction to this situation is expressed in Plaintiff's Hanson Exhibit 3 (212-214).

Mr. Heller suggests in Plaintiff's Hanson Exhibit 4 that du Pont "should kill off anyone around the country who wants to do their own converting". Mr. Hanson did not share this view, and does not know of anyone who was ever "killed off". Apparently, du Pont did not act on Heller's sugestion (225, 231-232, 248), for self-converting users are definitely increasing (250).

In the same letter, Mr. Heller states that he talked to Messrs. Hines and Dean of du Pont regarding self-conversion by direct customers of du Pont. Mr. Hanson cannot verify this statement of his own knowledge (233).

In Plaintiff's Hanson Exhibit 5, Mr. Heller states that Mr. Lake of du Pont agreed with him regarding policy of reducing converting costs. Mr. Hanson cannot verify this of his personal knowledge (233-234).

(24)

In Plaintiff's Hanson Exhibit 6, Mr. Heller states to Lester Zimmerman that Mr. Lake promised that du Pont would silence talk by du Pont men of 15¢ conversion costs. Mr. Hanson does not know whether Mr. Lake said this to Mr. Heller (234).

Plaintiff's Hanson Exhibit 8 contains a statement by Mr. Heller that Mr. Lake called him and "advised me that the letter which Buzz Barbur wrote is very dangerous . . . ." Mr. Hanson does not know whether Mr. Lake

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called or whether he made the statement, and has no idea what the allusion is (234-235).

Plaintiff's Hanson Exhibit 9 purports to be a request from Mr. Heller to Mr. Lake for assistance on "a case history of packaging every product . . . ." Milprint never got this from du Pont. The document also refers to Mr. Lake of du Pont as Milprint's "boss", which he was not, in any sense whatsoever (235-236).

Mr. Hanson was shown Plaintiff's Hanson Exhibit 10, a letter from William Heller of Milprint to Ed Lake of du Pont containing an offer to Mr. Lake of Milprint stock without payment, in 1947. Mr. Hanson knows nothing of this, does not know what favors Mr. Heller did for Mr. Lake, or whether it had any effect on Milprint's business (174-177). From his knowledge of the list of Milprint stockholders as a teller of proxies, Mr. Hanson knows that Mr. Lake has never been a shareholder of Milprint (237). (25)

In spite of Mr. Heller's remarks in Plaintiff's Hanson Exhibit 10, he does not believe du Pont did better by Milprint than by others. He does not know whether Mr. Lake told Mr. Heller that du Pont had done better by Milprint than by others. He is not familiar with any du Pont sales policy toward small converters, and did not know of any du Pont policy not to sell them (174-177).

Mr. Hanson did not recall any statements regarding du Pont's treatment of Milprint, nor statements made to M. T. Heller by Billy Heller in a letter dated December 13, 1945. He thinks du Pont was fair to Milprint (191-192), but no more or less so than to any other customer (125-126).

Plaintiff's Hanson Exhibit 11, a letter from Mr. Hanson to Milprint's Sales Managers in the field, purports to pass

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along a comment of E. C. Lake of du Pont to the effect that with the increasing of cellophane supply over demand in 1949, du Pont would have more film available and would sell to converters, who had up to that time been unable to obtain film. This has nothing to do with a policy of not selling small converters (177-179).

Bert Hefter, Shy Rosen and L. R. Zimmerman are purported addressees of Plaintiff's Hanson Exhibit 11. At the date of the document Hefter was Sales Manager of Milprint, Rosen Manager of Eastern Operations, and Zimmerman Manager of Chicago Operations (238). In 1944, Hefter had been Manager of Eastern Operations (26)
(239). In 1946, Rosen held this position, if he had left military service by that time (241). Mr. Hanson testified that the number of converters of cellophane had substantially increased since the date of Plaintiff's Hanson Exhibit 11 (239).

Plaintiff's Hanson Exhibit 12 purports to contain a statement of Mr. Hefter that Mr. Heller had discussed with E. C. Lake the printing and jobbing of cellophane by H. D. Catty Co. Mr. Hanson thinks that Heller did discuss this with Lake, but that nothing came of the discussion (240). Other statements are made in the document by Mr. Hefter which Mr. Hanson cannot verify of his own knowledge (240).

Mr. Hanson recalled that Milprint could not sell unconverted cellophane. It could make no money selling unconverted cellophane at the market price, and thus did not do it. Mr. Hanson could not recall whether the contract with du Pont restricted resale in unconverted form, but

economies were against such sales (180). Milprint's converter discount was not sufficient to conduct a business of reselling unconverted cellophane at list prices (181).

Mr. Hanson is not sure whether Milprint complained to du Pont that H. D. Catty Co. jobbed and converted cellophane while Milprint only converted, but was generally familiar with a dispute between Milprint and du Pont over (27)
this (181-182, 226). He does not think that du Pont did anything about Catty's freedom to do this, or the freedom of Brooks Paper Co. to do it, because they continued to do both (218-219). Mr. Hanson would refer small orders for unconverted cellophane to a paper jobber (240).

Plaintiff's Hanson Exhibit 17 purports to be a report from Rosen that he tried to persuade E. C. Lake to instruct du Pont salesmen to push Milprint's "Revelation" wrap in the baking trade. Mr. Hanson recalls that du Pont took the position that if bakers wanted to use it, they would use it, and they could make up their own minds (241-242).

Plaintiff's Hanson Exhibits 18 and 19 purport to be reports by Hefter and Rosen, respectively, of conversations with E. C. Lake. Mr. Hanson does not know whether these conversations took place, or what Lake might have said if they did (242).

Plaintiff's Hanson Exhibit 20 purports to be a report by Zimmerman as to what a Mr. Greenblatt of Milprint was told by third parties of H. D. Catty's converting activities. Mr. Hanson does not know of his own knowledge what statements were made to Mr. Greenblatt (243).

Certain statements purportedly made by William Heller in Plaintiff's Hanson Exhibit 22 Mr. Hanson can verify of his own knowledge (243).

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(28)

Mr. Hanson could not say that letters shown him by Government counsel on cross-examination that were not written by him or to him were genuinely or authentically what they purport to be, since he saw a good share of the correspondence for the first time when shown it by Government counsel. Statements contained in letters written by him are true. As to the other letters, Milprint officials are not in the habit of writing untruths, but it is a question sometimes of interpretation out of context, and so forth (209-210, 246).

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D.X. 1019

(1)

NARRATIVE SUMMARY OF DEPOSITION OF RUDOLPH E. ELMSTROM

Taken December 12, 1951, Chicago, Illinois

Rudolph E. Elmstrom is Purchasing Agent for Armour & Company, a major U. S. meat company. He has been with Armour since 1918, and has been connected with packaging of products since 1929 (3).

Mr. Elmstrom identified a document marked Defendant (Elmstrom) Exhibit No. 1 for identification as a letter to Armour from the Department of Justice, dated August 2, 1951, inquiring as to the packaging of butter and sliced bacon, and a document marked Defendant (Elmstrom) Exhibit No. 2 for identification as Armour's reply, dated August 14, 1951. Elmstrom Exhibit No. 2 correctly states the facts as to the inquiries in Elmstrom Exhibit No. 1 (4-5).

Armour began using cellophane in 1929 or perhaps a year or so before, when the price was from $1.50 to $2.00 a pound (5). At that time glassine was Armour's principal flexible wrapping material, and it was also using greaseproof paper and vegetable parchment (5).

In 1950 Armour's use of flexible wrappers for retail packaging on a dollar basis was about 45% cellophane and the remainder parchment, greaseproof, etc. (80).

The method of packaging Armour products has changed from time to time due to a combination of consumer demand and competition (5-6). Armour goes through a change of packaging on each of its products any time it can improve

~~D.J. 1019~~

(2)
packaging (8) For a given product, Armour generally uses the same package throughout the United States (6).

Some of the changes that have occurred in the packaging of Armour products are as follows:

1. *Frankfurters and Sausages:* Originally frankfurters were sold in bulk in 5, 6, and 10 lb. cartons. A competitor began wrapping a small number with a band, and Armour later went directly from bulk sales to a cellophane wrap of 10 frankfurters to a package (6). The Visking casing for the individual frankfurters, called "No-Jax", is removed in the process of preparation, and never goes to the customer (49, 70). However, some frankfurters are still made with animal casings (49).

Link sausage is made in animal casings, and bulk pork sausage to some extent is packed in cello-rolls (49-50). Armour has also used a cellophane overwrap on a 1 pound pork sausage carton that had a window, and a glassine overwrap on a similar carton for 1 pound sausage when the carton did not have a window (63-64). Armour uses Visking casings for sausage meats, getting them from Visking Corporation, and from the Sylvania Division of American Viscose Corporation which manu-
(3)
factures sheet cellophane and sausage casings. It has never purchased sausage casings from du Pont since du Pont manufactures sheet cellophane but not sausage casings (48-49).

2. *Frozen Meats:* Packaged in a carton lined in some cases with cellophane and in some cases with a polyethylene coated paper (6-7).

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When Armour's frozen meat package was put out for retail sale, the meat in some cases was visible through a window in the carton, and at other times not visible because the carton was without a window (62). The present carton for frozen meat has no window, but has a picture of the product on the cover (62).

3. *Shortenings:* Packaged in a paper board carton with a greaseproof paper liner. Some are packed in tin pails. Armour tried cellophane as a packaging material for shortening, but it was not successful commercially (7).

4. *Poultry:* Wrapped in Cry-O-Vac. Armour also has had cellophane wrappers for poultry (7).

5. *Dried Beef:* Was packaged in a carton with a vegetable parchment liner and also in glass. Cellophane was later used and is still used to package dried beef. (4) This was one of Armour's first uses of cellophane (7-8).

6. *Smoked Meats:* The normal Armour wrap for smoked ham and slab bacon is a combination triple wrap of glassine on the inside, next a light weight sheet of chip board, and greaseproof paper or parchment as the outer wrapper (8, 45).

Smoked ham butts and smoked picnic hams were originally wrapped this same way for many years. Later cellophane was adopted as a wrap for smoked butts and picnic hams and is still used to wrap them. The original combination triple paper wrap is still used on smoked ham and slab bacon. However, printed cellophane was used at one time as the outer wrapper over two layers of

colored paper on one type of ready-to-eat ham, known as "mello". There is still quite a trade in slab bacon. Both smoked ham and slab bacon are large and heavy pieces (9, 46-47).

Since Armour began wrapping its smoked meats other than hams and slab bacon in cellophane 15 to 18 years ago, cellophane has been replaced in part by cellulose casings made by Visking Corporation. These are used as a wrap for part of Armour's production of smoked butts and smoked hams so that the same type of

(5)

smoked butt is packaged in some cases in cellophane and in some cases in Visking casings (9-10, 47). The Visking casings Armour uses for hams and butts is a cellulose product of thicker gauge and less clarity than cellophane, but is primarily the same product as cellophane (47-48).

Whether smoked ham has eye appeal is a matter of opinion. Mr. Elmstrom felt he could buy better if he saw the ham, whereas Armour apparently feels the wrappers used do a better job for the product than a transparent wrapper, not because of the comparatively large size of the product, but because of the nature of the meat. Hams are not ordinarily wrapped in transparent wraps because the other wraps do a better job, and not because the ham itself lacks eye appeal (45-47).

On some of Armour's other uses of cellophane, the transparency of the cellophane contributes nothing to the package since there are opaque inner wraps. An example of this is the "mello-cooked" ready-to-eat ham (9, 62-63). However, it is possible that transparency was desired to enable the yellow liner paper to blend

with the design printed on the cellophane outer wrap (75-76).

(6)

7. *Processed Cheese:* Packaged in a special cellophane parawax pouch made by Marathon Corporation, enclosed in a paper board carton. These are two and five pound loaves (10).

8. *Sliced Bacon:* Armour first packaged sliced bacon in a carton with a greaseproof or a glassine liner, later in wraps of glassine, greaseproof paper and vegetable parchment, and still later changed to cellophane for much of its sliced bacon packaging (10, 11, 60). It originally used printed 300 PT cellophane to package bacon in a roll, and now uses both that type for the cello-roll pack of sliced bacon and also a special heat-sealing type on Armour's new tray pack type of sliced bacon packaging (10-11, 65). The tray pack is a chip board back with a cellophane overwrap (65). Armour has used it about 2 years, and it has become popular in the last year and a half (65). Armour also continues to sell sliced bacon in the cello-roll, and layer packed sliced bacon in greaseproof or parchment dividers that fold over (65). Both materials are satisfactory as far as keeping and carrying qualities are concerned (66). It has also used Pliofilm and other forms of transparent material, such as glassine, for packaging sliced bacon (40-41). Armour does not package all its grades of

(7)

sliced bacon in cellophane, but packages some ends and bottom pieces exclusively in greaseproof paper (11).

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The Mullenix pack for sliced bacon is an inner wrap of opaque waxed paper glued to an outer printed cardboard shell. The bacon is not visible. Armour has used that pack only experimentally, but its competitors in sliced bacon use the Mullenix pack, and Armour's bacon competes with bacon in the Mullenix pack (64-65).

Parchment and greaseproof paper are competitive with cellophane for sliced bacon, the biggest tonnage item for Armour. Currently, Armour wraps 60% to 65% of its sliced bacon in cellophane, and the balance in either greaseproof paper, parchment or glassine. About 20% of the total is in greaseproof and 10% in vegetable parchment. Armour has also used Pliofilm for sliced bacon (40-41).

At the time Defendant's (Elmstrom) Exhibit No. 2 was written, Armour's use of wraps for sliced bacon may have been 60% cellophane, 30% parchment. Armour has been through a period where it has had to alternate between greaseproof and parchment as a bacon wrap on the basis of their availability. When greaseproof was not available, it had to shift to higher priced parchment. Unavailability of packaging materials sometimes drives Armour to substitute one for another. (41-42).

(8)

Armour sells the same quality sliced bacon in its two leading packages, the tray pack, which employs cellophane, and the parchment non-supported wrapper (42-43, 66). It charges a price differential of 2¢ or 3¢ a pound for the same bacon in the cellophane wrap. Armour may or may not be appealing to a different

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market when it wraps sliced bacon in cellophane than when it wraps the same bacon in parchment. A customer goes into a store where Armour's two bacon packages are offered and buys whichever bacon looks better to the particular customer (42-43).

Armour is able to charge a higher price for sliced bacon by using cellophane and is entitled to it because cellophane costs more (43). People will buy the same bacon at a higher price when wrapped in cellophane, because they probably think the bacon is worth it (43-44). Armour wraps a great deal more bacon at the higher prices in cellophane than it wraps in parchment (44).

Changes occur in consumer preference and Armour changes its wrapper to accord with these changes (65-66, 76). For 20 years Armour has had changes continuously. In each case, its belief as to consumer preference was a factor in the change (65-66). Armour has

(9)

not had much experience with the difficulty of removing a product from cellophane because of consumer acceptance, but Mr. Elmstrom felt that if Armour removed sliced bacon from cellophane and its competitors did not, Armour would be penalized (33-34, 77, 79). This would occur more in the case of a change from cellophane than in changing the bacon wrap between parchment and greaseproof. There is a greater persistence to consumer preference for the cellophane wrapped sliced bacon, whereas consumer acceptance is not markedly affected by interchanging greaseproof and parchment (77). From the standpoint of consumer acceptance, for sliced bacon cellophane is not interchangeable to the

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same degree with greaseproof or parchment as they are with each other (77, 79).

If a very decided consumer preference for a particular wrapper on a particular product has been manifested, that has much to do with whether or not competition exists between that wrapper and others. Armour has observed such a consumer preference at the moment for cellophane on the tray pack of sliced bacon. If Armour wrapped bacon in other materials, it would find some consumer resistance. However, Armour has not found consumer preference to the same extent for (10)

cellophane on any other product, although there might be some consumer resistance to cellophane on butter. Consumer preference has an effect upon the ability of materials to compete (33-34). Despite consumer preference, because of price and cost, other alternate wrappers than cellophane are used on some products on which Armour wishes to use flexible packaging materials (81).

From Armour's standpoint, whether a packaging material is ideal for a product is not an absolute matter even in the case of sliced bacon, since Armour sells it in more than one material. Greaseproof and parchment are ideal in carrying and keeping qualities, but the drawback is exposure of part of the bacon to air and handling. There is definitely a demand for sliced bacon packaged in glassine or parchment, rather than cellophane (66-67).

9. *Butter*

Armour uses vegetable parchment or foil as a direct wrap for its butter, with a carton around it. Cellophane

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was used in a small way some years ago as a direct wrap for butter with the idea of selling butter without a supporting carton (4, 50). Cellophane, however, is not a well adapted material for wrapping butter and there might be some consumer resistance to wrapping it in that material (33-34, 52). Transparency and eye appeal of the product itself are not particularly important (51). A butter wrapper has to retain the color of the butter, must strip cleanly from the butter, and must be suitable for retaining that part of the butter not immediately used (51). Mr. Elmstrom had been told that cellophane is hard to strip from butter and is inclined to smear. For wrapping butter, Armour can get a better functional use from parchment at lower cost than it can from cellophane (51). (11)

When Armour has a new product or is contemplating a change in the packaging of an existing product, the normal process is for the proposed new package to clear the Purchasing Department, and then to be submitted to the Research Department for tests (11-12). After the tests are completed and a cost comparison is made, the Production Control Section of the Sales Division decides on whether a change will be made. In making a decision as to packaging, Armour's only predilection toward any particular flexible wrapper is based on what the sales department has learned regarding consumer demand or what they must meet from competition (11-12).

The principal factors that govern Armour's decision as to which wrap it will use for a product are appearance of the product, protection of the product and cost of the

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material. Appearance of the product is the primary factor (12)
and is related to protective qualities of the package which must preserve the appearance. Cost is important, for the product has to be competitive. More must be charged for an expensive package, and it is a question of whether the customer will accept it and pay more for that product in that package (12-13).

No wrapping material is a perfect wrapper for all purposes for all products. Various products have their ideal wrapper, and as to each product there are certain things to be accomplished that one wrapper will do better than the others, generally speaking (34). Armour seeks to find an ideal wrapper for each product, and at any given point in time tries to use what it then regards as the ideal wrap (60). Armour's judgment as to whether a wrap is ideal is not based on a single factor, but on price of wrap, its protective quality and consumer acceptance (60-61). When Armour changed to or from cellophane as a wrap it considered the other wrap as ideal at some time, and at another time considered cellophane ideal for the same product (61).

Competition between materials as a wrap for a given product does not stop when Armour adopts one of the materials for the product. A superior wrapper in the sense of protection and price competes with a less good wrapper for a particular product (73).

When cellophane is doing the merchandising job, its transparency is one characteristic that accomplishes this end. No commercially offered material is more transparent. Cellophane does not have a quality beyond its transparency (13)
that assists it in selling products (35). The expression

"eye appeal" refers to the appeal of the product itself showing through the cellophane; it is not the cellophane that is appealing, although it may add something where it is an overwrap over something such as a plain carton (35-37). The addition of cellophane to the product does not present it in a more attractive state than its natural state, and the eye appeal will exist with no wrapper at all if the product is right (35-36).

The display value of a package is the product itself, provided there is good transparency. As for display value of the cellophane, if Armour could not show the consumer the product, it would not use cellophane to any extent. The reason is that the use of cellophane would be money thrown away. Armour would use some cheaper non-transparent material instead (37-38). Where display of the product is important, waxed paper is not as desirable as cellophane. However, Armour uses parchment to package bacon leaving part of the bacon exposed, which exposure is the objectionable feature to using parchment and greaseproof (38-39, 66). Where Armour wishes to present products to the public in the natural state, it would not use foil (39). It might use Pliofilm, if the price differential were not too great and Pliofilm did a better job of protection. Armour does use a combination Pliofilm-cellophane bacon package (39). This is a laminate, and laminates are competitive with cellophane on a price basis (39-40).

When Armour uses cellophane as a wrap, the primary (14)
motivation is display, but that is not the only reason (83-84). When it uses paper wraps, such as greaseproof, waxed paper, parchment, display of the merchandise is just as im-

portant to Armour. These materials are not as transparent, but they do display the product (83). Armour sells a great many products in opaque packages, and each package affords display in the sense of telling what the product is and that it is made by Armour. Armour tries to make the opaque packages as attractive as possible, and chooses each one because it believes the package is attractive (84).

When Armour wants a combination of complete protection plus display of the product, greaseproof, parchment and wax paper are not alternate with cellophane (83-84). Waxed paper producers have improved their product as to transparency, and as to the attractiveness of printing, but its transparency does not approach that of cellophane (67, 77-78). They have kept pace with the improvements in printing cellophane and other materials (67). Glassine has improved during the last twenty years both in transparency and in printing, (67-68) but is not as transparent as cellophane (78). Cellulose acetate film compares favorably with cellophane in transparency, and Armour has experimented with it (67).

Armour has not purchased cellophane exclusively from du Pont or Sylvania for any appreciable period, and has also purchased cellophane from Olin Industries (15). About 60% of Armour's purchases of cellophane have been from converters and about 40% direct from producers (16). (15)

Most of the portion of Armour's cellophane that it purchases unprinted direct from producers has been coming from Sylvania during the last year. It has also purchased cellophane direct from du Pont (52-53). Armour never purchased enough cellophane direct from either du

Pont or Sylvania to obtain a quantity discount, although it was aware that both had a discount arrangement which existed many years ago (53, 70-71). Armour did not purchase unprinted cellophane on a large scale until it adopted the tray pack for sliced bacon in 1950 (53). Armour was also aware that converters got a discount from both du Pont and Sylvania, but did not know what the converters did with the discount (53, 71).

More than half of all the cellophane used by Armour, including both direct and indirect purchases, is of Sylvania origin (53-54). Armour has had no more quality difficulties in operating with Sylvania cellophane than it has had with du Pont cellophane proportionately. Armour has a research division that regularly investigates cellophane quality, including heat-sealing, has used a great deal of Sylvania cellophane in the last twenty years, and has not found that Sylvania cellophane in heat-sealing characteristics is markedly inferior to du Pont (54, 59-60). Armour buys most of its cellophane in sheets rather than in rolls, and most of its use of cellophane is a hand operation rather than on automatic packaging machines. Armour makes no cellophane bags and does no cellophane printing (59). (16)

The tests of cellophane by Armour's packaging research are not made on high speed automatic packaging machines (59-60).

Armour's principal sources for converted cellophane have been Daniels Manufacturing Company, Shellmar Products Co., Cellu-Craft, Milprint, Traver Corp., Standard Cap & Seal Co., Marathon, Inc., and Wraps, Inc. (16, 56). It does more dollar business with Daniels than with any other converter or with Sylvania. Armour has been

doing business with Shellmar and Milprint since it started using cellophane, and from Wraps, Inc. within the last four or five years (56-57). These converters compete intensively for Armour's business. Each seeks to sell on the basis of quality of work, price, service, etc. (16-17).

Armour understands that the cellophane it gets from Milprint, Traver, Shellmar and Marathon is du Pont cellophane. Armour started out with Daniels because they sold Armour printed cellophane for less than Armour could buy it elsewhere (57-58), and most of the time Daniels' prices have been lower than those of other converters. Armour has been doing business with Daniels since at least 1920, and was buying printed greaseproof paper there before Daniels started converting cellophane (72-73).

As between cellophane converters, such as Shellmar, Marathon, Milprint and Traver, there has been no uniformity of price. Similarly, on other converted wrappers the prices differ as between converters (58, 73).

Except in the case of Marathon's special cheese, wrap, (17)

Armour can usually buy any particular bag or wrapper from more than one converter (58). Armour has purchased cellophane and at least one other flexible wrapping material from each of the following: Shellmar, Milprint and Daniels, and has purchased waxed paper as well as foil from Wrap-in-Wax (17-18). The salesmen of the converters from whom Armour buys more than one material usually handle the entire line of flexible wrapping materials that the converter is offering (18).

Producers of parchment and the producers and converters of greaseproof paper, glassine and wax paper constantly try to sell Armour. Their principal selling point is

price; that is, the savings of these materials as against the more expensive packages of cellophane and Pliofilm that Armour might be using (18-19).

The reductions in cellophane prices between 1930 and 1947 had quite an effect on Armour's volume of purchases, since Armour would automatically use more cellophane as the price was reduced. The increases in price since 1947 have had no effect on Armour's purchases (14).

Armour used considerably more cellophane in 1951 than it did in 1930. The increase has been gradual over a period of time and arose principally from greater sales by Armour of products it was wrapping in cellophane. Armour's business has increased generally since 1930 and all its products have been selling in greater volume (14-15).

Armour has received technical assistance from du Pont. As a specific example, Mr. Schaffer of du Pont made many (18)
calls to the Armour plant and went out to the departments teaching them how to handle and use cellophane and how to wrap a product with it. Also, du Pont and Armour cooperated in preparing material on the use of cellophane in connection with pre-packaging of meats for self-service markets (19-20).

Armour has also regularly received commercial and promotional service from du Pont, such as promotional literature or packaging ideas (20).

Sellers of other flexible wrapping materials likewise provide promotional and technical service to Armour, but are not as active as du Pont in that field and their service is less extensive (20-21).

From Armour's standpoint, cellophane competes as a packaging material with glassine, greaseproof, parchment,

foil, acetate, and polythene, and the competition is substantial (21-23, 40). The price, protective quality, and appearance of each material are factors in this competition (22). In determining whether packaging materials are in competition, matters that must be considered are price, the finished package, the keeping quality of the material, how the material handles in packaging operations, and any decided consumer preference (32-33).

By competition between other materials and cellophane, Mr. Elmstrom had in mind that Armour used the other materials on other packages; for instance, parchment and greaseproof on sliced bacon, parchment on butter, foil on (19)
butter, and cellophane on butter to a small degree (23). There has been no continuous concurrent use of parchment and cellophane on butter (23-24). Mr. Elmstrom believed that different products are competitive as a wrapper because they are all used for the same product, as in the case of smoked ham (24). Cellophane, greaseproof and parchment are all used for smoked hams. Armour does not now use cellophane for this purpose, but cellophane has competed for wrapping hams. The cellophane people have tried to get Armour to put cellophane on hams and Armour's competitors have used cellophane on hams (24). When others are using a material to wrap a product competitively with Armour's similar product wrapped in another material, the two wraps are competitive. For example, a medium sized packer in St. Louis, possibly named Krey, was using cellophane to wrap all its smoked hams (24-26, 45). As another example of competition, on Armour's frozen meats such as pork chops, hamburger, pork cutlets and others, Armour

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uses a carton for consumer packaging that is lined with either cellophane, or a paper coated with polyethylene wax (26-27, 62). Cellophane was formerly used and has now been displaced by the polyethylene coated sheet. For about six months or a year, during which the coated paper was replacing cellophane, Armour used both materials concurrently (26-29). The polyethylene coated paper was found to be a better material for that purpose, and Armour now uses it, but it would be possible to go back to cellophane again, and Armour would do so if it could save money by changing back to cellophane (28-29).
(20)

Two products can be classified as in competition when their price is quite significantly different, provided the higher priced one does the job it is supposed to do for the purchaser (29-30). Armour has seven or eight different grades of sliced bacon of which White Label Star is the top grade, and Dexter is the lowest quality. Mr. Elmstrom did not know whether Armour considered these two grades in competition, or if it considered any of its high-priced bacon as in direct competition with its low-priced bacon. He was in a position, however, to know that in the wrapping field a high-priced wrapper can be in competition with a low-priced wrapper because of his closeness to that field (30-31).

On the basis of price, cellophane might be in competition with a costly aluminum laminate on some products, depending on the product. It might be bacon, as the foil people have tried to sell Armour on the idea of using foil on sliced bacon. Armour does not use foil on sliced bacon because the trend is to wrapping sliced bacon so that the customer can see it. Even though foil might bring the

bacon to the customer in better condition, it is the eye appeal at the time of purchase that probably switches the packer to cellophane for a sliced bacon package (31-32).

Price differentials have an effect on competition between wrapping materials and are taken into consideration by Armour (31-32). The Company has to determine whether (21)
it is to its advantage to spend more money for a particular type of packaging that will do the job better than another type that would cost less. Tests on this are being made constantly (31). Armour pays more for the polyethylene wax coated paper used for lining the frozen meat carton than for other waxed papers because its research shows that it carries the product better and does more (68-69).

Pliofilm and foil are higher in price on an area basis to Armour than cellophane, while greaseproof paper, parchment, glassine and waxed paper are lower (74-75).

Armour buys primarily bleached or unbleached glassine, but no waxed or lacquered glassine. It uses waxed parchment as a liner for the pork sausage carton, and coated paper liners for frozen meats (68).

About 60% of the cellophane used by Armour is moistureproof and non-moistureproof could not be substituted for the uses it has for moistureproof (15-16). Armour purchases a variety of types of moistureproof cellophane. New types have been developed through the years and have influenced Armour's purchases to a great extent (21). As an example, Armour started packaging frankfurters in cellophane about 1940. It used a type of film which at that time had been recently developed. No type of cellophane available prior to that time was entirely satisfactory for

wrapping frankfurters, which require a sheet that will heat-seal and that will not smother the product (22-23).
(22)

Armour consults the following publications in connection with its packaging problems: Modern Packaging, Food Industries, Packaging Parade, Good Packaging, Paper Trade Journal, Meat, and National Provisioner. Mr. Elmstrom believed the Company subscribed to practically every packaging publication (12-13).

Aside from some difficulties in getting deliveries in 1939 and 1941, due either to a cellophane shortage or limited facilities of converters (78), up to the latter part of 1950 Armour was able to obtain all the cellophane it would have liked to have had (54-55). Armour had noted a postwar shortage in cellophane for its uses for the first time in the fall of 1950 (78, 81). Even during 1951, however, it came close to obtaining all it needed (54-55). Its purchases of cellophane have been allocated but its requirements, if they ran above, would not exceed the allocation by more than 5% or 10% (55).

All wrapping materials were in short supply during World War II, and all papers and other wrapping materials were short again during 1951 and the last half of 1950. In these periods Armour could not get all it wanted of any wrapping material (69-70, 78). The wartime shortages in greaseproof, parchment and waxed paper did not persist through the years 1946-1948. Within a year or so after the end of hostilities, most of these paper wrappers were freely available (78-79).

The shortage of greaseproof and parchment in the last year and a half or two years was due to unusually large

(23)

demand in connection with limited supply. There is only so much wood pulp available; and there was not enough pulp to satisfy demand.

There has been a sharp increase in the demand for packages in a consumer size since the war, both in the meat industry and in the food industry, generally (82). Armour's use of cellophane has risen tremendously in the last year and a half, and its use of other flexible packaging materials has increased since World War II (82-83).

The shortage of cellophane has been serious to Armour, which used all its resources to spread the cellophane around as thinly as possible. The tray pack sliced bacon package which it adopted in the last year and a half required more cellophane than heretofore, and Armour had to work hard to get its allocations increased. In one or two cases, Armour may have had to curtail the use of cellophane on a particular wrapper because of its unavailability, and possibly it has delayed changing to cellophane as a wrap for some uses until it became more readily available (55-56).

Although the condition of the cellophane supply in recent years has required Armour to make special efforts to use the available cellophane to cover its needs, only in a few cases has it been forced to make a substitution of materials (71); whereas the shortage of greaseproof paper did force the subsfitution of parchment, and vice versa (71-72).

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D.X. 1019-A

Defendant's Elmstrom Exhibit 1

DEPARTMENT OF JUSTICE
WASHINGTON, D.C.

Address Reply to
"The Attorney General"
And Refer To
Initials and Number

HGM:MAH
60-32-13

August 2, 1951

Armour & Company
Union Stockyards
Chicago, Illinois

Re: United States v. E. I. du Pont de Nemours and Company, Civil Action Number 1216 (Delaware).

Gentlemen:

In connection with the Government's preparation for the subject litigation, which is pending in the United States District Court for the District of Delaware, it is urgently necessary for the Department of Justice to ascertain certain facts concerning the materials employed in wrapping one of your products.

Toward this end, your voluntary cooperation is sought in the form of answers to certain inquiries covering the subject matter during the period, 1940 to date, as follows:

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1. What flexible wrapping material or materials have you purchased and commercially used for the wrapping of butter and sliced bacon.
2. If more than one material was so employed, what has been the approximate ratio of use for each.
3. Kindly identify the sources of supply for these materials.
4. If you have changed the type of flexible wrapping material used on this product, state the specific reason or reasons for the change, and when the substitution was made.
5. If cellophane was used and has been displaced, at any time, by another flexible packaging material, state the name of the supplanting packaging material, when the substitution was made, the precise reason or reasons for the change. To what extent has the unavailability of cellophane influenced your choice.

(2)

6. Has this product ever been wrapped concurrently in cellophane and some other packaging material? If the answer is affirmative, for all purposes of your business are the materials perfectly interchangeable.
7. If cellophane and some other flexible packaging material are or were both used at the same time for the packaging of identical units of this product, state the reason or reasons for the concurrent use of these two materials, and the factors involved in your decision to use two or more types of wrapping materials.

8. What physical characteristics do you consider to be of principal importance in the wrapping of this product, and to what extent does cellophane meet these qualifications.

9. Have cost differentials between the various wrapping materials available, affected the selection of those used on your product. Is cellophane within your cost range and to what extent does an increase or decrease in the cost of the wrapper influence resale of your product.

Due to the shortness of time before the resumption of trial in the above entitled case your prompt cooperation in answering the above questions will be appreciated.

Sincerely yours,

/s/ H. G. Morison

H. G. MORISON
Assistant Attorney General

D.X. 1019-B

Defendant's Elmstrom Exhibit 2

ARMOUR and COMPANY

Law Department

Chicago 9, Illinois

August 14, 1951

The Attorney General
Department of Justice
Washington, D. C.

Re: United States v. E.I. du Pont de Nemours and Co.
Civil Action Number 1216 (Delaware)
HGM:MAH 60-32-13

Dear Sir:

This is in answer to your request of August 2, 1951 requesting certain information with respect to our use of flexible wrapping materials on butter and sliced bacon. The following answers, supplied by our operating personnel, are numbered to correspond with the numbers of the questions asked:

1.

(a) Butter

Parchment paper
Laminated aluminum foil
Cellophane

(b) Bacon

Cellophane
Parchment paper

295

2477

6010

1. (cont'd)

Greaseproof paper
Pliofilm
Acetate
Combination of cardboard carton and cellophane

2.

(a) Butter

Approximate ratio of parchment to cellophane 200 to 1
Approximate ratio of parchment to aluminum foil 10 to 1

(2)

(b) Bacon

Cellophane 60%
Parchment 30%
Greaseproof paper, pliofilm, acetate, combination cellophane and cardboard carton, tin and glass 10%.

3.

Cellophane

Sylvania Division of American Viscose Corporation
E. I. du Pont de Nemours & Company
Miscellaneous jobber sources primarily

Kirchheimer Brothers
Central States Paper & Bag Company

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3. (cont'd)

Parchment

Kalamazoo Vegetable Parchment Company
West Carrollton Parchment Company
Paterson Parchment Company

Greaseproof paper

Hartford City Paper Company
Rhinelander Paper Company
Miscellaneous converters

(3)

Pliofilm

Goodyear Tire and Rubber Company
Standard Cap and Seal Company

Acetate

Celanese Corporation

Laminated Aluminum Foil

Reynolds Metal Company
Aluminum Corporation of America
Miscellaneous converters

Nos. 4, 5, 6 and 7

All of the stated flexible wrapping materials at various times have been used concurrently as shown in answer No. 1 above. Changes have been made from time to time for sales or production reasons. We have never had to switch from using cellophane because of its unavailability. We started using cello-

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phane on butter as an overwrap for cartons in 1948 on about 1% of our production and laminated aluminum foil on butter in 1950 on about 10% of our production. All of the stated flexible wrapping materials are interchangeable for use as inside wrappers on butter. All of the stated flexible wrapping materials which are transparent are interchangeable as overwraps for butter. All of the stated flexible wrapping materials are, with minor exceptions,

(4)

interchangeable within the same grades of bacon. The consumer acceptance based mainly upon "eye appeal" is of primary importance in deciding which flexible wrapping material to use.

8.

Prevention of spoilage
Flavor retention
Prevention of shrinkage
Eye appeal
Protection from outside contamination
Ease of handling in packaging

Cellophane meets all of these requirements except when used as interwrap on butter. When cellophane is placed in direct contact with butter it loses its "eye appeal".

9.

Cost differentials between various flexible wrapping materials have some effect in determining the material

to be used on these products, but these differentials are not of primary consideration. Both butter and bacon are perishable products and are sold competitively in a market in which the consumer makes the price. Generally the consumer's preference in a particular market determines the choice of flexible wrapping material used.

Cellophane is within our cost range of the flexible wrapping material for both butter and bacon. Except for laminated aluminum foil which is more expensive, moderate increases or decreases in the cost of flexible wrapping materials have no appreciable influence on the resale of butter or bacon.

Very truly yours,

GEL'r

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D.X. 1020

NARRATIVE SUMMARY OF DEPOSITION OF ROBERT F. NELSON

Taken February 18, 1952 at New York, N. Y.

Robert F. Nelson of Rhinelander, Wisconsin is First Vice President of Rhinelander Paper Company ("Rhinelander") with offices in Rhinelander. He has been with the Company since January, 1947 (2). From June 1, 1946 until the end of 1946, he was Price Executive of the Pulp & Paper Branch of OPA. From 1944 through 1945, he was a U. S. Naval officer. For twenty years prior to 1944, he had been President of the Glassine Paper Company of West Conshohocken, Pennsylvania, producers of glassine and greaseproof paper (2-3).

Rhinelander was incorporated in 1903 and began the manufacture of newsprint in 1904. About 1912, it began manufacturing butcher's paper, which it no longer makes. Around 1914, manufacture of tissue for napkins and creping began. By 1918, Rhinelander had stopped manufacturing newsprint. It began manufacturing greaseproof and glassine about 1918, and supercalendered sulphite in the early 1930's (46-47). The only tissue it now manufactures is a waxed tissue called "Masterwrap", an interfolded paper used in bakery shops for lining paper or hand lining of boxes at the time of sale (48-49).

(2)

In 1925, sulphite papers and waxed greaseproof papers were the dominant materials in flexible packaging, with sulphite paper having the larger volume. Vegetable parchment was probably behind waxed greaseproof in volume (35).

Rhinelander today produces glassine and greaseproof paper and supercalendered sulphite paper. The Converting Division coats glassine and plain paper and laminates glassine (3-4). The Company makes its own pulp from its own timber (4).

Of the ten mills in the United States producing glassine and greaseproof, Rhinelander is the largest U. S. manufacturer of greaseproof, and of glassine and greaseproof taken together. Mr. Nelson was not positive that it is the largest manufacturer of glassine alone (7, 59).

Rhinelander has seven glassine and greaseproof machines and one sulphite paper machine, two of its glassine machines being the largest in the world (7).

Rhinelander's sales were approximately $7,500,000 in 1946 and $14,750,000 in 1950 (18). Much of this increase was due to increased volume, though there was some increase in price. On a volume basis, there is substantially greater demand for flexible packaging materials for prepackaging in consumer units than there was in 1946 or before World War II (18-19).

(3)

Over a period of time, Rhinelander's sales average close to 90% for protective packaging, and 10% for all other uses (88-90).

On a dollar sales basis, for the calendar year ending September, 1950, the Company's production was glassine 42%, greaseproof paper 23%, supercalendered sulphite 11% and paper processed by the Company's converting plant 24%. These proportions have continued (11-12). Out of a total of 45,000 tons sold by Rhinelander in 1950, 7500 tons was sulphite and the remainder greaseproof or glassine (58-59).

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For the year ending September 30, 1950, 75% of output was sold to converters and 25% to final users. This proportion has continued approximately, though the final user percentage has probably increased a small amount (12).

In the same period, 300 of the Company's 1300 customers were converters. Its customers have increased since that time (12-13). On a tonnage basis, sales to the three largest converters amounted to 30% of total output for the year ending September, 1950. These converters have continued to take approximately that proportion or probably somewhat less, but not more than 10% less (12-13).

On the basis of tonnage, Rhinelander itself converts about 15% of its raw stock, which after conversion would be about 20% of finished tonnage. Sales of the converted stock are about 25% of total sales (91-92).

(4)

The following companies are customers of Rhinelander, directly or through converters:

Armour & Company
A & P
Continental Baking Company
Curtiss Candy Company
General Foods
National Biscuit Company
Standard Brands
Sunshine Biscuit Company (24-25).

Rhinelander's ten largest customers have purchased from nine to forty years continuously and, on the average, its three largest have purchased for at least twenty-five years. Its customers include many of the largest and best

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known processors of foodstuffs, candy, coffee and other package merchandise (25-26).

In the flexible packaging market, Rhinelander's products do not generally have a separate and distinct group of end uses for which no other product is sold, though there might be a specific case (112).

Glassine, greaseproof or sulphite paper is sold by Rhinelander to customers who use cellophane as well as Rhinelander's products. For example, its converters sell Rhinelander's supercalendered transparent type sulphite to (5) bakers for wrapping bread, and the same bakers will use cellophane on some breads of different shape or type (100-101; 115).

As stated in a 1951 stock prospectus prepared wholly without reference to the cellophane antitrust suit, it is true that "The Company's products are competitive not only with like papers produced by other members of the industry, but also with other wrapping and packaging materials, notably cellophane. It may be noted that the great development of the glassine and greaseproof industry has occurred since the introduction of cellophane. Availability of both glassine and cellophane in volume has encouraged and promoted the trend toward the sale of goods in pre-packaged form" (6-7, 13).

Cellophane is the product with which Rhinelander's products compete most directly and is Rhinelander's most annoying competitor (17). Rhinelander takes accounts from cellophane with some frequency, but less frequently than accounts are lost to cellophane (34-35).

In crackers, National Biscuit Company makes a four-in-one fractional package using waxed glassine while another

company, Schulze & Burch, uses cellophane for the same cracker package (14). In the case of the pocket pack of Kleenex, Rhinelander has part of the business with a wrap of an opaque printed lacquer coated glassine and cellophane has part of the business because of its better heatsealing (6)
(15, 103). In nibbling foods, such as corn curls, lacquer coated sheets of glassine are used in combination with cellophane to form a duplex bag (15). Foil is also used as a bag for snacks or potato chips with sulphite paper as a backing. Rhinelander likewise sells printed and waxed glassine paper for potato chip bags (15-16).

In 1940 or 1941, glassine was substituted for a great many places where cellophane had been sold. Glassine was classified very early by the WPB as an essential paper for food packaging to take the place of other types of packaging, such as tin cans and films (18).

Considering all flexible packaging materials, glassine competes most directly with waxed sulphite paper on one hand and cellophane on the other. It does not compete with tin cans, except as flexible packaging competes against rigid packaging as a whole. For example, in the case of a folding box, Rhinelander tries to sell greaseproof or glassine paper to line the box (42-43).

When asked whether he believed glassine and greaseproof had a market of its own, Mr. Nelson replied that he sold into the packaging field and that if he had a segment of the market that no one could invade, he would not even have salesmen. Glassine and greaseproof papers fluctuate back and forth in the field of the low priced sulphites, grease-
(7)
proof papers and packaging materials of that sort, and back

and forth in the high priced field in the foils and other materials. Rhinelander feels, as does everyone that is in business, that it is in the middle, with papers on one side and transparent films, foils, and similar packaging materials on the other. Rhinelander competes both with that sort of packaging materials and with the low priced ones (93-94).

Glassine competes with cellophane so far as "impulse buying" is concerned, if that means to buy a product that the customer knows he had before and was good before, for Rhinelander's constant aim is to put its materials into packages that will sell (94-95). If "impulse buying" means only that the product must be seen clearly through the package, then Rhinelander does not compete with cellophane on that factor (95). Glassine and greaseproof papers are cheaper than cellophane unless they are coated and laminated. When coated and laminated they are sometimes more expensive, but not if they are colored and selling against colored cellophane (95-96). They also give more moistureproof protection than cellophane and make as tight a package if heat-sealed when coated or laminated (96).

Basically, most paper is the same and has no special protective characteristics unless and until it is given additional (8).
treatment. Glassine and greaseproof are inherently different from other papers because they are greaseproof. Vegetable parchment is also inherently different from other papers (84-85).

In making greaseproof paper, the pulp is cooked and beaten longer than in the ordinary paper process. The fibers become saturated and gelatinous in texture; the resultant product is translucent and highly resistant to oil and grease (4-5, 22-23).

Glassine is produced by dampening greaseproof paper and then passing it through a supercalender stack under heat and great pressure. The stack consists of 14 to 22 rolls with alternate steam heated steel rolls and hardened paper rolls, with an unheated steel roller as the final bottom roll. This process develops the considerable transparency and surface gloss that are characteristic of glassine. It is inherently greaseproof, can be sealed by heat if coated, is frequently made moistureproof by coating with appropriate lacquers or waxes, and may be printed readily (23-24). Glassine is more smooth and dense, and has a higher finish than greaseproof paper. A twenty pound greaseproof paper is approximately .00125 of an inch thick and when made into glassine is .001 of an inch thick (6, 23-24).
(9)

Rhinelander makes various types of glassine in weights from 18 pounds to 50 pounds, per 500 sheets, 24" x 36" (67-68). By volume of sales, the most popular weight of glassine is 25 pound or 30 pound. The largest selling type of lacquer coated glassine paper is a single ply 24 pound basic paper, lacquer coated to 27 pounds, used for wrapping bread and making display bags. Two-ply laminated glassine represents between 6% and 10% of Rhinelander's production (68-69).

Rhinelander uses several trade names for its types of glassine. Kleerview, representing between 5% and 15% of sales, is described in Rhinelander's price list as supertransparent, meaning it is the most highly transparent product manufactured by Rhinelander. Mr. Nelson estimated this type has 70% total transparency, as opposed to 100% for cellophane (62-64).

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Kleerwax, Rhinelander's trade name for its standard bleached glassine, is made in two tints, one called Kleerwrap and one called white glassine. Combined sales of these two would be between 10% to 20% of Rhinelander's total sales. The term "transparent" in the price list used to describe Kleerwrap glassine means it is transparent as opposed to opaque. Mr. Nelson estimated Kleerwrap had 25% to 45% transparency compared to cellophane at 100%, but was uncertain whether his transparency comparisons were correct (64-65).

(10)

Rhinelander's cream bag glassine is a cream shade of the same grade as Kleerwrap and white bag. It is also termed transparent as opposed to opaque glassine, and is generally used waxed for potato chip bags (66-67). Rhinelander usually sells only two types of paper for potato chip bags: normal standard grades, which are then printed and waxed; or lacquer coated glassines, usually colored because Rhinelander has a price advantage over colored cellophane (67).

Rhinelander produces glassine principally against particular specifications for customers. These specifications differ considerably, depending upon the end use, shelf life, grease and moisture protection, odors, season, and the geographical locations in which the wrap is to be used (7-8, 28). Rhinelander has over 200 different sets of individual customer specifications for glassine. Two producers of the same product sometimes have different specifications for the wrapper (8). When Rhinelander is attempting to sell a new customer, it sometimes tailors a paper for the particular product of the particular customer by learning the requirments as to shelf life, grease, moisture,

and odor resistance, and making a paper to meet the needs. After the customer uses a trial roll on his machine, Rhinelander tests some of the packages in a room with 100° temperature and 90% relative humidity (28).

(11)

By various methods Rhinelander can change the strength, hydration or coating characteristics of its papers (28-29). Further processing of Rhinelander's paper, either by itself or an outsider, can be waxing, printing and then waxing, printing and then lacquer coating, lamination before printing and then lacquering or waxing (12).

When Rhinelander's papers are coated the normal procedure is to print before coating. Stock is steadily shipped from Rhinelander Paper Company to Daniels Manufacturing Company in Rhinelander, Wisconsin, who prints it and then ships it back to Rhinelander which coats it. In effect, Daniels Manufacturing Company by these two steps sells a completely converted product (111-112).

Rhinelander sells glassine to other converters, in addition to Daniels, who also convert cellophane.

When Mr. Nelson first entered the glassine business about 1926, the bulk of sales were for making glassine bags for packaging many things, including specialty breads and candy bars. Other people in the glassine industry were selling it to waxing converters who used it for all types of purposes, particularly the packaging of crackers and similar items (49). At that time the glassine bag, wherever greaseproof requirements were indicated, supplanted a plain paper bag. It also permitted the packaging of such things as

(12)

ground coffee in bags which previously had been packaged

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in bean form in ordinary sulphite paper. Ground coffee also has always been packaged in tin cans (49-50).

Among the large uses for Rhinelander's paper today are bags for candy, pies, peanuts, popcorn, snack foods, dried fruits, soup mixes, baking pre-mixes, drink powders, bread and cake wrappers, candy bar wrappers, candy cups, cheese packaging and wrapping, coffee bag liners, wrappers and bags for frozen ready-to-cook foods, dry cereal packaging (inner wrappers), ham wrappers, bacon wrappers, liners for lard, oleo or butter cartons, liners for doughnut trays and baked goods, retail meats (inner wrappings for packages prepared at butcher's counter) and soap (inner wrappers) (9-10).

Glassine is also used for packaging poultry, dairy products, tobacco products, textiles and hosiery, drugs, [and] medical supplies, transparent patches in window envelopes and for stamped envelopes (9-11, 21-22).

The bulk of the Company's sales is in rolls as opposed to sheets, and generally in the full mill roll, with slit rolls only a minor part of its business (11, 104).

The principal uses for glassine today are for the lining of cardboard where there are greaseproof requirements, (13)
the packaging of crackers, and the wrapping of bread, dry cereals and candy (50). Glassine is used in the cereal field as a waxed wraparound or as an inner wrap. In other uses, it is principally used for moisture vapor protection as an inner wrap (50-51, 103-104).

The report of the Glassine & Greaseproof Manufacturers Association for the year 1951 of all uses connected with packaging or wrapping of foods, beverages and tobacco, lists the following end uses for glassine and grease-

proof in addition to those already mentioned: cakes, cookies, sweet buns, potato chips, rolls, chocolate and tea powders, ice cream, ice cream bars, bonbon cups, pudding powders, ice cream mixes, chewing gum, prepared gelatins, dairy products, cigarettes (for dispenser machines or export), bakery labels, nuts, shredded cocoanut, spices, baking powder, meat patty separators, sandwiches, dehydrated vegetables, dried yeast and dried eggs (113-114).

There are many types of glassine available from Rhinelander (30). By volume, the largest type sold by Rhinelander is the waxing grade used for the packaging of crackers, which can be bleached or amber colored, for customers such as National Biscuit Company (60-61, 114-115). The next largest type is a cereal grade which has high strength and low porosity (60-61). Other important types are the candy bar grade, a translucent high finish paper called Kleerview (61).
(14)

Rhinelander's nitro-cellulose coated glassines are used not only for bags, but for standard wrapping purposes as an overwrap on things such as envelopes, plates and dixie cups (22, 110).

The principal uses for greaseproof papers are for board lining, for wrapping oleomargarine and butter, and for wrapping meat products, such as hams or bacon (31, 117-118).

On the basis of volume, the principal types of greaseproof paper sold by Rhinelander are Lardpak and ham wrap. Ham wrap is made in 30, 31 and 35 pound weights (69-70).

Lardpak and a snowdrift glassine for cardboard lining have very high greaseproofness (29). Brown 'n' Serve roll cartons have a greaseproof paper lining treated so the

rolls can be finished in the housewife's oven without removing it and the rolls will not stick to the pan (34).

The principal use of Rhinelander's supercalendered sulphite paper is for the packaging of specialty breads. This paper is double waxed, which gives it a high finish and a very high translucency (51-52). It is sold largely in the South and Southeast, as a bread wrap in the same way as opaque waxed paper (52-53). Other principal uses of sulphite paper made by Rhinelander include lining aluminum foil where the foil is put into a food package, such as soup mix or potato chip bags (53).
(15)

Rhinelander features any type of coated or laminated paper. In laminations it strives for flexibility, since the papers are usually used as an inside liner on automatic packaging machines. On coated papers it strives to get a coating that will run on a fast packaging machine and heat-seal properly, and give whatever vapor protection is desired (29).

Rhinelander laminates glassine to glassine, and on occasions cellophane to either glassine or greaseproof (55).

The Revelation wrap originally consisted of two strips of glassine with a film such as cellophane between them in the center so that the customer could see more clearly through the cellophane. It was generally used where no protection was required, and the plain glassine reduced the cost of the combined package. In that particular instance, each of the products served a separate function and had separate characteristics (101).

As a laminate to the interior of a frozen food carton, glassine possibly reduces the necessity for some other type of liner in the package (110).

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The National Biscuit Company cookie package has a glassine liner for the carton and is overwrapped with cellophane (101-102).

(16)

Neither glassine nor greaseproof is used in supermarkets today to wrap fresh meats or fresh vegetables. These papers would not be suitable unless they were wet strength types, and unless they were waxed they would not properly wrap fresh vegetables (99-100). Customers apparently feel that transparency would be important as to self-service meats and vegetables. Mr. Nelson thought that other flexible wrappings in addition to cellophane are in the fresh vegetable market (112).

Prior to production of cellophane, glassine was used as an outer wrapper for cigarettes. Glassine has not regained this business, except for cigarettes in certain dispenser machines, but Mr. Nelson could not say why. He thought transparency was a factor, but hesitated to answer whether eye appeal was an important factor because he is trying to sell glassine and greaseproof (102-103). Philip Morris recently used an over-wrap of glassine for cigarettes in dispensing machines because of the shortage of cellophane, availability of glassine, and lack of need for added protection in the machine. The cigarette packages are visible in the average vending machine. Whether the person operating the machine looks at the button that has to be punched or at the package is doubtful. Mr. Nelson believed cigarette customers purchased chiefly by brand name (116-117).

The Planters Company uses cellophane to package peanuts in most of the United States, and uses laminated coated

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(17)

glassine bags for their 5¢ pack in the Northwest, Minnesota and Canada because cellophane will not stand up there in winter time. Peanuts are also sold in bulk in printed sulphite paper bags lined with glassine, and are also sold in tin cans (16-17).

At least half of Rhinelander's glassine, greaseproof and supercalendered sulphite papers are used or sold as inner wraps. For this use transparency is not important (96). Mr. Nelson did not believe that glassine and greaseproof papers compete with cardboards as such or paper board boxes, except in the sense that for a dry pack either a glassine bag or a cardboard container could be used and these products would be in competition (96-97).

Rhinelander's products compete with sulphite paper. Although the conventional way of wrapping bread is a printed, heavily waxed opaque sulphite paper, Rhinelander sells printed and lacquer coated glassine, at approximately the same price for the same purpose, particularly for specialty breads (14).

Rhinelander's products compete with vegetable parchment in the meat industry for lard packaging, bacon packaging and other types of meat packaging. There is also competition between vegetable parchment and greaseproof paper for butter and oleomargarine wrappers (20-21).

(18)

Rhinelander encounters competition from polyethylene in almost any place where a laminated or lacquered glassine bag might be used, and moisture protection is involved (40-41). Rhinelander has lost some business in ham wraps to Cry-O-Vac and gotten it back (41). Mr. Nelson knew of no case of competition between glassine and cellulose acetate (41). Rhinelander meets the competition of Saran where

very low moisture vapor transmission is required, countering Saran's competition with Pliolite or laminated coated papers (41-42).

Glassine competes to some extent with tin and glass because ground coffee is now sometimes packaged also in glassine lined bags. Mr. Nelson felt the competition was a little far-fetched, because of the material difference in cost. The same thing does not apply to cellophane with respect to colored coated glassine. In that case, cellophane would be in the ratio of six to five, whereas the price difference between the glassine lined bag and the vacuum tin prices would be about ten to one (87-88).

Rhinelander purchases urea from du Pont for plasticizing paper, and certain products for treating its plain paper on the paper machine. From du Pont and other chemical companies, it purchases nitro-cellulose types of coating for (19)
lacquer coating, to which Rhinelander adds the wax. This is used to coat paper, which is in competition with cellophane since it is sold into the same fields and at approximately the same price (55-56). Rhinelander's coated paper can be made into a bag that will stand up, but cellophane cannot. Such a colored lacquer coated glassine for bags also has an edge in price over colored cellophane (56, 103). Nitro-cellulose coated glassine is also used as part of a duplex bag, particularly where color is desired. A duplex bag can be made of two glassines, two cellophanes or of one lacquer coated glassine and one web of something else; also of a waxed glassine and cellophane, although Rhinelander has sold none of that type (56-57, 107-108).

Although cellophane is now in ample supply, nitro-cellulose coated glassine is still used for the four-in-one

cracker package, for which waxed glassine and sulphite are also used (110-111). At the present time, Rhinelander is contemplating laminating cellophane to greaseproof for a butter wrap, to try to compete with foil which is laminated to greasephoof or sulphite. Cellophane was chosen since it makes an attractive package when reverse printed, and the greaseproof is used in the laminate both for protection of the butter and because it can be colored yellow (57-58).
(20)

When the cigarette industry adopted cellophane as an overwrap it had a severe impact on the glassine industry for about six months. As a counter measure, the glassine industry brought out a lacquer coated glassine which had the advantages of moisture protection and heatsealing over previous glassines (35-36). Cellophane has made most of its inroads against glassine, except for cigarettes, in the nibbling foods. Glassine also had considerable volume in specialty breads before cellophane got into that market, and is still sold to some extent for that purpose (35-36).

The development of cellophane types has a definite relationship to the development of glassine types. For example, the development of rancidity resistant cellophane was countered with an opaque glassine (37, 103). Similarly, glassine was laminated before cellophane was laminated (37). The development of cellophane as a packaging medium made the glassine industry work hard. Since 1930 the glassine industry has increased in volume somewhere between four and five times, while the paper business other than newsprint has not increased to that extent (37-38). Cellophane rather than glassine or Pliofilm was the leader in the development of characteristics in its material for use in the high speed

automatic packaging machines. This stimulated the glassine industry to develop papers that would run over the same machines, particularly lacquer coated papers. Glassine is (21)
now used consistently in packaging with high speed machinery, and Rhinelander believes it works satisfactorily on such machines (38). Rhinelander attempts to get the same speeds that it runs up against in competition, and by competition Mr. Nelson meant the speed of cellophane (31).

Mr. Nelson assumed that the flexible packaging materials market is part of an overall general packaging market (116).

Mr. Nelson identified as true copies of price lists of Rhinelander Paper Company the documents marked Defendant's Exhibits Nelson No. 1, which covers non-moisture-proof papers, and Nos. 2 and 3 which cover moistureproof types (43-46).

Plain glassine costs somewhat less than half the price of cellophane, while lacquer coated costs approximately the same as cellophane. Laminated glassines are approximately 20% higher in price than plain glassines. In Rhinelander's selling effort, it makes a point of the relative cost of glassine and cellophane, especially in the case of colored lacquer coated glassines, which are considerably cheaper than colored cellophanes. These glassines are generally used in a duplex bag in combination with an uncolored cellophane (30-31).

All the products packaged in glassine could be described as low profit items (108). Du Pont's price reductions on (22)
cellophane, in Mr. Nelson's opinion, tended to hold glassine prices down. The lowering of cellophane prices was defi-

nitely a factor that people in the glassine industry would consider in determining what their prices would be. Rhinelander competes directly with du Pont with its lacquer coated papers, and the price of cellophane would act as a brake on the prices of uncoated paper (38-39). A sharp reduction in moistureproof cellophane prices would probably cause Rhinelander to lose its business on lacquer coated papers, and to reduce its prices on laminated glassines. It would probably also affect plain glassine and greaseproof (39). On the other hand, a sharp increase in cellophane prices without a corresponding increase in glassine prices would probably cause increased sales of moistureproof glassines (39-40).

Glassine has better grease resistance than greaseproof paper, but Mr. Nelson did not know how it compares with cellophane in this quality (31-32).

Resistance to rancidity, to transmission of light, and to the transmission of air or vapor are selling points for glassine and greaseproof papers, particularly for such products as chocolate candy bars (32).

Glassine and greaseproof obtain wet strength by the addition of resins and can then compete with vegetable parchment (32-33). Glassine has better dead fold than cellophane.
(23)

Packages made with glassine appeal to the eye. Rhinelander seeks to sell glassine through the selling of brand names and printing, since it has a smooth surface and prints well. Realizing that it cannot achieve 100% transparency, Rhinelander sells on the basis of a pleasing package, emphasizing that a well designed glassine package will stimulate the sale of the product (33-34, 109).

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Mr. Nelson considers glassine and greaseproof papers separate and distinct products from other types of papers. He considered glassine and greaseproof papers as less unique products than he did twenty years ago. He considered cellophane separate and distinct in that glassine is a paper where the paper stock has been treated mechanically, and cellophane is regenerated cellulose. He had never thought of cellophane as a unique product (53-54).

Waxed paper is not greaseproof, but is grease resistant if it has polyethylene or micro-crystalline wax mixed with the paraffin wax (85-86).

Mr. Nelson identified "Plaintiff's Nelson Exhibit 1" as a booklet issued by the Glassine & Greaseproof Manufacturers Association (GGMA) to interest people in the purchase of glassine and greaseproof papers. (81-82).

Mr. Nelson agreed with the following statements in Plaintiff's Nelson Exhibit 1:
(24)

> "The food industries rely heavily upon glassine and greaseproof because of their totally unique character and because they strike the nicest balance between performance and cost that the packaging world knows" (85).
>
> "Glassines and greaseproofs supplement the good qualities of many other materials. They combine with paperboard to produce some of the neatest and most useful packages of our day. They make protective, strong sheets, in combinations with kraft. They assist foils and various transparent films to do the jobs that only these good materials can do but can do better with our help. They often are combined into complex structures so specialized and

custom built that they serve just one highly individual purpose."

"All of the good things about glassine and greaseproof are available to the user at exceptionally low cost—because of paper. They do things that once upon a time only tin and glass could do. In many instances they are called to package products that are extremely marginal—where every split cent counts. The use of glassine and greaseproof on so many low priced 'commodity types' of food items is high testimonial to their economy" (86-87).

Mr. Nelson, however, agreed only in general with the following statement and believed it should not have been included in the pamphlet:

"Again, we say that we are paper people writing this message. We are not unmindful of the role played by metal foils, transparent films and various other papers. Ours is a message about glassine and greaseproof papers. Naturally we want to talk about our product and we figure we have a good story to tell. Most packaging materials are available as is (if foil has what you need, you buy it. If cellophane is required—if your product must be seen—well and good, you buy it)" (83).

(25)

The characteristics of Rhinelander's papers, particularly greaseproof and glassine, adapt themselves to use in the packaging of foods for protection, retention of aroma, exclusion of harmful odors, and appearance. More than 90% of the paper produced by Rhinelander is used in the food industry and most of the balance in other industries where transparency or resistance to moisture or both are desirable (8-9). According to Mr. Nelson, this use of the word

transparency is rather loose and does not refer to glass clear transparency. Rhinelander has always spoken of transparency in this field, but when pinned down refers to it as translucency (8-9).

Mr. Nelson found it very difficult to say whether his Company's products would not be satisfactory if a customer wanted complete transparency. If a person has to have the clearest flexible packaging material and has no requirement except to see through it, glassine would not be as good as cellulose film (65-66). Yet, glassine has a gloss and sheen which is sometimes close to that of cellophane (64).

Visibility was unimportant in the four-in-one cracker pack in a carton, but might be in the small individual package of four crackers that is served with soup in a restaurant. This individual pack is usually wrapped in cellophane, but Rhinelander sometimes convinces customers that the glassine wrapper can be torn more readily than cellophane (115-116). (26)

Greaseproof papers are not considered transparent, but in the trade are spoken of as translucent because if held flat over a piece of printing it is possible to read the printing through them. Rhinelander sells a translucent greaseproof paper to the United States for use as a map overlay tracing. Sales of this paper are somewhat less than 1% of total sales (70-71). Although greaseproof paper does not compete with glassine or cellophane in transparency, it is about $40 to $60 a ton cheaper in cost than glassine, or less than half that of cellophane, depending on the grade of cellophane (71).

Rhinelander makes a supercalendered transparentizing sulphite paper that definitely impels the purchase of bread, and, in the wrapping of specialty bread, its greatest com-

petition is cellophane (71-72, 109). Transparency is not important in the buying of bread because customers feel a loaf for freshness, regardless of the wrap (115). Rhinelander's production of this paper in 1950 was 15,000,000 lbs. out of 90,000,000 lbs. total production (72). Its distinguishing characteristic is that when double waxed it becomes as transparent as a very highly transparent glassine. It is moisture vapor resistant when waxed, and is rarely used unwaxed except in lamination to foil (72-73).

Rhinelander's position is that transparency is not essential for a great many uses where cellophane is now sold (27)
(118). Mr. Nelson in seeking to sell glassine and greaseproof thinks of additional qualities other than transparency that will serve the packaging purpose (118-119).

Attractively printed glassine and greaseproof can be sold against cellophane on the basis of appearance for the same purposes as cellophane. In a beautiful glassine print job with a finish, a shine, and a transparency there is more appeal from the printing than if Rhinelander went out and tried to say that glassine was as clear as cellophane (92-93).

Rhinelander does not manufacture or convert any transparent film except by laminating it to greaseproof or glassine. It converts some aluminum foil in laminations for a stereoptican type disc. Both cellophane and glassine for this use would have to be laminated (97-98).

When there was a shortage of cellophane, Rhinelander obtained business from manufacturers who had previously used cellophane, for example, in various nibbling types of food products. When the cellophane supply situation eased, some but not all of these returned to cellophane. Mr. Nel-

son could not understand why any went back to cellophane, and considered them foolish (98-99). Mr. Nelson preferred not to answer whether visibility was important in the return of some users to cellophane because he had to keep himself in the frame of mind of selling Rhinelander's prod- (28)
ucts, and he does not try to do anything except to break down the reasoning of such customers. He has a packaging material to sell and tries to sell it (99).

Rhinelander sells its transparent glassines both coated and uncoated. When coated they are moistureproof and also more transparent than before (90-91). Between 12% and 25% of Rhinelander's sales consist of the moistureproof transparent types (91).

Glassine resists the passage of vapors, but is not 100% gasproof. It is moistureproof only when lacquered, laminated or waxed (90).

Rhinelander's glassines coated with "Pliolite", and its coated laminated glassines are more resistant to moisture vapor transmission than is cellophane. Waxed glassine when flat has better moisture vapor transmission resistance than anything other than Pliolite, but loses much of this quality when creased (31).

Rhinelander has received no complaints that glassine or greaseproof wrappers have a tendency to collect dust (90).

In promoting its products Rhinelander advertises in Time, Business Week and most of the trade publications that go into the food field and the packaging field, such as Modern Packaging (26). Modern Packaging is a recog- (29)
nized journal for the packaging industry which is consulted by a great many of Rhinelander's sales and technical people

(43).

Rhinelander does not have a market research program as part of its sales effort. Its package development program consists of a committee to coordinate laboratory work in conjunction with sales and distribution (26-27). Rhinelander has complete technical control of its production, a technical sales service unit and an informal research program. Its salesmen call on both the converter trade and the direct trade (27-28).

Rhinelander is a member of GGMA. Other members are Riegel Paper Corporation, Westfield Paper Corporation, Hamersley Manufacturing Company, Hartford City Paper Company, Kalamazoo Vegetable Parchment, Nicolet Paper Company, Columbia River Paper Company and Deerfield Glassine Company (74). The other companies until recently were Rhinelander's principal competitors in the sale of glassine and greaseproof paper, but competition is increasing from Sweden, Germany and other European countries (74). Rhinelander, Riegel, KVP and Columbia River are probably members of other paper associations as well. Rhinelander is a member of the Sulphite Paper Association, but not the Wax Paper Association (75). Cellophane manufacturers are not members of GGMA, as they are not manufacturers of glassine and greaseproof paper, (30)
to which the membership is limited by the charter (75-76, 80). This goes back to 1933 when the paper industry was reorganized.

Mr. Nelson has never considered whether it would be of value to the GGMA to have a representative of the cellophane industry, since GGMA is an organization of the paper industry, not of the flexible packaging manufacturers

(78). Rhinelander could belong to the Flexible Packaging Association, but had never thought of doing so. One reason was that if Rhinelander attempted to join an association of its customers they might think Rhinelander was trying to pull something over on its customers or over on the Department of Justice (78-79). No plastic film manufacturers are members of GGMA, but if Rhinelander had started making cellophane and continued to make glassine and greaseproof, it could retain its membership in GGMA (79).

Rhinelander did consider the manufacture of cellophane two or three years ago and decided not to go into that manufacture because of the amount of money involved (79-80).

Cellophane manufacturers would have many of the same type of problems and activities that the glassine and greaseproof manufacturers have, as to sale into the flexible packaging market (76-77). Although cellophane producers have manufacturing problems different from those of glassine (31)
and greaseproof producers, Mr. Nelson pointed out that the two different types of manufacture were one thing while most of the questions directed to him had to do with the market, which is still another thing (77, 80).

Members of GGMA have mutual technical problems, collect statistics and learn something about the history of their market and from that can draw curves in order to determine where they are going. The market Mr. Nelson was speaking of was the market that Rhinelander sells into, the flexible packaging market (77).

Progress of a company in a business such as Rhinelander's is dependent upon constant improvement and modernization of plant facilities. The Company's position has improved due to its substantial program of expansion and modernization executed during the period 1940-1950 (104-105).

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Installation of its No. 6 machine in 1941, No. 7 machine in 1948, and No. 8 machine in 1951 more than doubled its capacity compared with 1940 (40).

During the last ten years heavy demand for Rhinelander's products has compelled it to operate most of the time at full capacity twenty-four hours a day for a six day week. The demand exceeded the supply from early 1947 until the middle of 1948, and from the middle of 1950 until about November, 1951 (19-20). The current market for flexible packaging materials is in relatively free supply. Glassine mills are running at about 90% capacity (20).
(32)

In 1950, the Company considered rebuilding a paper machine so it could produce more glassine, but decided against it since demand for supercalendered sulphite paper was so intense that to take a machine out of production would have meant hardship for many customers who were already short of paper (105). In September, 1951, the demand for glassine and greaseproof papers was still beyond Rhinelander's ability to supply. New uses for its papers are constantly being found, and new products are frequently developed for which its papers are logical packaging materials. Rhinelander energetically pursues these new uses and products and strives for the utmost in diversification (106). It has scarcely touched a number of fields for the sale of its products, due to lack of available supply, but it is now invading them vigorously (106).

Mr. Nelson had no feeling one way or another with respect to the case. He has worked for the Government about half his life. He regards it as his Government, and has been shot at for it several times (119).

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D.X. 1020-A

Defendant's Nelson Exhibit 1

RHINELANDER PAPER COMPANY

GCPR—Sheet No. 1

THESE PRICES DO NOT EXCEED CEILING PRICES ESTABLISHED UNDER APPLICABLE OPS REGULATIONS

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

EFFECTIVE 6/29/51
(SUPERSEDES LIST DATED 11/30/50)

GLASSINE AND GREASEPROOF

	Sheets—Untrimmed, 600 square inches and larger			
	Wrapped Jumbo Rolls	Ream Banded 500 Count Cased	Ream Marked 500 Count Baled	100 # Uncounted Bundles
KLEERVIEW GLASSINE—20#	$26.75	$28.25		
25 and 30#	23.75	25.25		
KLEERWRAP GLASSINE—20#	24.75	26.25		
25 and up	21.75	23.25		
BLEACHED GLASSINE—20#	24.75	26.25		
25-40#, incl.	21.75	23.25		
SNOWDRIFT GLASSINE—25-50#, incl.	22.75	24.25		
LARD-PAK S1A—30-40#, incl.	20.00*		$21.50	
LARD-PAK S3A (formerly coded XS/A)40#	22.00*		23.50	
BLEACHED GREASEPROOF—20#	22.50*		24.00	
25#	19.50*		21.00	
30-40#, incl.	19.00*		20.50	$19.50
UNBLEACHED GREASEPROOF—20#	21.00*		22.50	21,50
25-40#, incl.	18.00*		19.50	18.50

(*) Greaseproof rolls, rewound to special diameters, narrow widths, special put-ups, etc.

a. Add $1.00 cwt. for rewinding

b. Add differentials applicable for small diameters and narrow roll widths.

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Sheets on Skids—a) Ream marked, untrimmed sheets—deduct $1.00 from Case/Bale price.

b) Ream banded or sealed, or trimmed sheets—see differential schedule.

Deposit $10.00 each skid, refundable upon return. Minimum weight 2,000# per skid.

Small size sheets (under 600 sq.in.) & Narrow Rolls (under 6")—prices on request.
Plasticized Papers—orders specifying more than 8% standard plasticizer or any glycerine plasticizer—prices on application.

Prices are for standard put-ups, based on quantities of 500# or more of an item. Less than 500#, down to 100#, add $2.00 cwt. Less than 100# add $2.00 cwt. plus $1.00 packing and handling charge. Two or more items may not be combined to obtain lower price. ALL PRICES F.O.B. RHINELANDER, WIS. · TERMS: 1% 15 days, 30 net

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Defendant's Nelson Exhibit 2

D.X. 1020-B

RHINELANDER PAPER COMPANY

GCPR — Sheet No. 45

THESE PRICES DO NOT EXCEED CEILING PRICES ESTABLISHED UNDER APPLICABLE OPS REGULATIONS

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

List No. 11
Effective 6/29/51
Supersedes List Dated 11/30/50

DHS Lacquer Coated Glassines (Moistureproof & Heat Sealing)

Single Ply		Price Wrapped Rolls	Approximate Square Inch Yield Per Lb.
25# Silver Kleerview	(Super-transparent)	$44.50 cwt.	17,280
25# B-Yellow Kleerview	"	46.50	"
25# Tangerine Kleerview	"	47.50	"
27# Silver Kleerview	"	43.25	16,000
27# B-Yellow Kleerview	"	45.25	"
27# Tangerine Kleerview	"	46.25	"
27# Snowdrift	(Opaque)	43.25	"
33# Snowdrift	"	43.25	13,090
39# HW Glassine (Pouch Paper)	"	43.25	11,077
25# White Bag	(Transparent)	42.50	17,280
27# White Bag	"	41.25	16,000
33# White Bag	"	41.25	13,090
Wax Laminated			
54# Silver Kleerview	(Super-transparent)	44.50	8,000
54# B-Yellow Kleerview	"	46.50	"
54# Tangerine Kleerview	"	47.50	"
58# Silver Kleerview	"	43.25	7,450
58# B-Yellow Kleerview	"	45.25	"
58# Tangerine Kleerview	"	46.25	"
54# White Bag	(Transparent)	42.50	8,000
58# White Bag	"	41.25	7,450
58# Snowdrift	(Opaque)	43.25	"

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Minimum quantity 500 lbs.
Basis weights computed on 500 sheets 24" x 36" or 432,000 square inches per ream.
Prices apply to coated one side or two sides.
For rolls cased or crated—add $1.00 cwt.
For roll widths less than 6" but not less than 4½"—add $1.00 cwt.
For roll widths less than 4½" but not less than 3"—add $2.00 cwt.
Minimum roll diameter 9".
For sheets 600 square inches and over, in bales or cases—add $2.00 cwt.

ALL PRICES F.O.B. RHINELANDER, WIS.

TERMS: 1% 15 days, 30 net

RHINELANDER, WISCONSIN

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RHINELANDER PAPER COMPANY

GCPR — Sheet No. 46

THESE PRICES DO NOT EXCEED CEILING PRICES ESTABLISHED UNDER APPLICABLE OPS REGULATIONS.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

LIST NO. 18
EFFECTIVE 6/29/51
(SUPERSEDES LIST DATED 11/30/50)

2-PLY WAX LAMINATED GLASSINE

	Basis Weight 24x36—500	Jumbo Rolls Wrapped
KLEERVIEW (Super-transparent)		
Silver Shade	47#	$30.00 cwt.
	57#	26.75
KLEERWRAP (Transparent)		
Green Shade	47#	28.00
	57#	24.75
WHITE BAG (Transparent)	47#	28.00
	57#	24.75
CREAM BAG (Transparent)	47#	28.00
	57#	24.75
CANARY OPAQUE	57#	26.75
SNOWDRIFT (Opaque)	47#	29.00
	57#	25.75
AMBER BAG	47#	26.75
	52#	25.25
	57#	23.50

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Minimum quantity, one size and grade, 500#.)
Minimum quantity, Canary Opaque—10,000 lbs.
For rolls cased or crated—Add $1.00 cwt.
For roll widths less than 6" but not less than 4½"—add $1.00 cwt.
For roll widths less than 4½" but not less than 3"—add $2.00 cwt.
For sheets 600 square inches and over, in bales or cases—add $2.00 cwt.
Three ply, special combination, and special colors quoted on request.

ALL PRICES F.O.B. RHINELANDER, WIS.

TERMS: 1% 15 days, 50 net

RHINELANDER WISCONSIN

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NARRATIVE SUMMARY OF DEPOSITION OF LEO E. CROY

Taken February 12, 1952 at Chicago, Ill.

The witness, Leo E. Croy, is Vice President for Marketing and a Director of the Marathon Corporation, Menasha, Wisconsin. His business address is the office of that Company at Menasha. Marathon, founded in 1909, is an independent manufacturer of wood pulp, paper and paperboard, and a converter of these products for end uses in food packaging. Its wood pulp production is between 150,000 and 160,000 tons a year, none of which is a dissolving pulp suitable for cellophane manufacture. 85% of Marathon's total sales are for food packaging uses, representing approximately $75,000,000 as of 1951 (3-4).

Marathon was a merger of Marathon Paper Mills Company, Rothschild, Wisconsin, and the Menasha Products Company of Menasha, Wisconsin. Menasha was a converter of paper and paperboard, and Marathon Paper Mills was its largest supplier of pulp. Today Marathon does more business as a converter than as a manufacturer of pulp, paper and paperboard (56-57). Marathon is one of the largest converters in the country of the types of material it handles (33).

Mr. Croy has been in the packaging business with Marathon for nearly thirty years, closely associated with all phases of the business: food packaging, contacts with

(2)

machine manufacturers, converting and marketing problems (28-29).

Marathon is more interested in converting than in selling its manufactured raw materials, since it makes more money selling them in converted form than as paper or paperboard (58-59).

Marathon has converted cellophane since 1937. Its entry into this business arose from the development by Marathon's Research Division of a self-sustaining rubber and paraffin film called "Parafilm". Marathon sought to apply this film for cheese packaging, and finding it deficient when used alone, applied it to other products and hit upon an attractive and economical cheese package by using this film as a coating on cellophane. This cheese wrap, known as "Parakote", turns transparent in contact with molten or natural cheese. It has always been a substantial part of the cellophane converting done by Marathon, accounting for approximately 90% of Marathon's converted cellophane business at present. Prior to the development of this wrap, Marathon had no business in cheese wraps of another material (4-6).

"Parakote" is the name of the converted cheese wrap. "Parafilm" is the coating, a composition of white pale crepe rubber and crystalline paraffin wax; *i. e.*, "Parafilm" is an ingredient of "Parakote" (75).

(3)

"Parakote" is printed, then coated over the printed side with the composition. The printing provides package appeal, and the coating provides inhibition of mold by adhering to the cheese and preventing exposure to air. When shipped out by Marathon the coating is practically opaque, since it is dusted with an edible starch which disappears when hot molten cheese is poured into the wrap. The wrap is then

as fully transparent as uncoated cellophane (40-42, 54-55). This is substantially similar to the wrap Marathon made in 1939, though the coating is somewhat different (42). Marathon believes cheese packaging could be better performed by coating cellophane than by coating foil, papers and glassine, though it has worked with all those materials (56).

Marathon found that the moistureproof coating on MT cellophane, as made by du Pont, did not adhere properly to the film when converted to a cheese wrap and applied to cheese, and when the wrap was removed from the cheese the coating applied by du Pont would adhere to the cheese together with Marathon's coating. This was very objectionable, and MT was not used for making cheese wraps until the anchoring defect was sufficiently improved by du Pont to enable converted MT film to perform more satisfactorily for cheese wraps (71-72, 87).

(4)

At one time Marathon decided to make cheese wraps from uncoated PT cellophane, thinking that the Marathon coating material would adhere better to film not previously coated than to coated film, and that the wrap could sell at a lower price. This led to a discussion of infringement of du Pont's moistureproof patents, and du Pont granted Marathon a license under du Pont's patent No. 1,737,187, for a royalty (38-39, 42-43). This was the only written contract between Marathon and du Pont (39).

Negotiations between du Pont and Marathon for a license under du Pont patent were initiated by Marathon. Marathon did not challenge the validity of the du Pont patent. Mr. Croy did not recall whether any representations were made by du Pont during the negotiations as to the probability of granting future licenses under the patent,

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nor does he recall any discussions of provisions of the agreement relating to any favored nation clause or a concession of patent validity (43-45).

The license agreement between Marathon and du Pont was premised upon the wrap that Marathon was interested at the time in making, as is shown by specific mention of the wrap in the document (G. Ex. 2515) as Exhibit A thereto (70).

The royalty paid du Pont by Marathon on the license under du Pont's moistureproof patent was reasonable in comparison with royalties normally charged by Marathon on licenses under its patents, though Mr. Croy believes that (5)
the licensee always regards a royalty as excessive (64-65).

Marathon did not operate under the license, *i.e.*, did not coat PT cellophane, for a long period, but resumed applying its coating to moistureproof cellophane for cheese wraps. The wrap made of moistureproof cellophane proved to be a better wrap. It was more expensive than PT to buy, but did the job better, and no license was required to coat moistureproof cellophane. Moreover, the price differential between moistureproof and PT substantially diminished (48, 66-67; 71). Marathon now converts cheese wraps from moistureproof, anchored, heatsealing cellophane (86).

Mr. Croy was shown on cross-examination a letter to Mr. E. C. Lake at du Pont, Government Exhibit 2896, August 25, 1939. He thinks the subjects of the letter were normal considerations in a matter of this kind (47-48). In connection with the document, however, he recalls that Marathon was more concerned with the amount of royalty due under the license than with any question of acknowledgment by either party of patents held by the other (46-47).

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He does not recall being personally connected with the discussions, though he is sure he must have been (46-48).

Mr. Croy questioned that he ever saw the document shown him by Government counsel as Government Exhibit 2897, but recalled no objections posed by du Pont to the (6)

granting of the license, beyond normal bargaining. As part of this bargaining, Mr. Croy surmised that Marathon requested a license for numerous applications of coated film, and that du Pont limited it to cheese wraps (48-50). Mr. Croy did not recall any interrelation between the acknowledgment by Marathon of the validity of du Pont's patent, and any request for license rights broader than cheese wrapping (50, 74).

If Marathon had found a product it wished to make and had been restricted from making it by the license agreement with du Pont, Mr. Croy would agree that there was some relation between Marathon's acknowledgment of the validity of the du Pont patent and the limitation in the license to cheese wrap (77-78). He did not believe this was the case (77).

Government counsel showed Mr. Croy on cross-examination, Government Exhibit 2909. He did not recall the document and reading it did not refresh his recollection on any matters mentioned therein (50-51). Mr. Croy did not remember any discussion of any provision of the du Pont-Marathon license agreement providing for cancellation of the license, if or when Marathon stopped coating plain cellophane, nor does he recall du Pont's reaction to any such proposal (52).

MT cellophane converted by Marathon might have made a satisfactory meat wrap, but Mr. Croy assumed that

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(7)

Marathon did not go into the meat wrap business with a coated MT cellophane or coated PT cellophane because it could not commercialize the wrap in the trade (51, 67-68), though at the time the document was written, Marathon may have been anxious to obtain a license from du Pont to make such a wrap (51). Mr. Croy did not recall Government Exhibit 2912 (51-52).

Mr. Croy did not recall any discussions concerning Paragraph 2 of Government Exhibit 2515 (54-55).

Mr. Croy was sure that Marathon was displeased by du Pont's refusal to grant a license for coating cellophane for meat wraps, and agreed with Government counsel that this refusal put Marathon in a difficult position (53-54). Mr. Croy has no reason to believe that at the time of the license agreement with du Pont, that du Pont had any expectation of the development of other types of wraps by Marathon (79).

Mr. Croy was sure that if Marathon had been seriously interested in making meat wraps, it would have pursued the matter with du Pont, or gone into the business when the du Pont patent expired (77-78, 80). Mr. Croy did not remember how long he had pursued the matter of a license from du Pont (82).

Judging from Marathon's present large volume in other meat wraps, Mr. Croy believed that Marathon's Research and Development people would probably have revived the

(8)

cellophane meat wrap project, if it had been as promising as stated in Government Exhibit 2911 (80). At a later date Marathon must have concluded that the meat wrap was not as satisfactory as it had earlier believed. Marathon has been an aggressive converter, and, if the wrap had

proved to be satisfactory, Mr. Croy did not believe it characteristic of Marathon to give up an idea so easily (80-81).

Mr. Croy did not recall the dates or the occasion of correspondence with du Pont in connection with extending the license under du Pont's moistureproof patent to meat wraps, until he was shown the correspondence by Government counsel (83-84). He inferred from this correspondence that Mr. Lake of du Pont denied the request for a license covering the manufacture of meat wraps (84). He recalled that the first negotiations in connection with the license for cheese wraps were not connected in time with any later request for a license for meat wraps (85). He surmised that Marathon's approach to a license would have been a broad request, that Marathon gave up the request for a license for meat wraps, but that developments and improvements in coated cellophane made Marathon's objectives with respect to meat wraps different than in the case of cheese wraps (85-86).

Marathon meets competition in its rubber-wax coated cellophane cheese wrap from a similar wrap supplied to the trade by Milprint and by General Felt. A relatively small (9)

quantity of cheese is packaged in Pliofilm and in aluminum foil, the latter principally applied to Philadelphia Cream Cheese. Mr. Croy was not aware of other transparent materials used for cheese packaging (19). Prior to the development of Marathon's "Parakote" wrap, foil was the wrap employed for processed cheese (28).

Marathon's converting of other flexible packaging materials is concentrated principally on sulphite waxing paper, most of which is produced by Marathon and converted to

waxed paper for an end use product. Converted waxed paper wraps are sold by Marathon to the following industries: frozen foods, dairy, baking, meat packing, and a certain amount into stock products, such as household rolls of "Waxtex" (7-8). Marathon calls these rolls "transparent", though they are not as transparent as cellophane (60). Waxed paper converting accounts for a little better than 40% of Marathon's total business; converting of cellophane accounts for about 7½% of Marathon's food packaging business. Marathon also converts small quantities of aluminum foil and greaseproof paper laminated to paperboard (7-9).

In converting waxing stock to printed waxed paper the printing is applied directly to the paper, and the coating (10)
applied over the printing. Thus the printing shows through the wax (27).

The selection of a material and the design of a wrap is part of Marathon's method of building its business. It first selects an industry in which packaging business is desired, selecting certain products within that industry which are fertile fields for improved packaging. Marathon's Research and Production Departments develop a package, and a machine to apply it, in an effort to produce a better and more economical package, to that extent influencing the customer as to the package he should use. Marathon makes results of laboratory tests on different wraps available to the trade, and its selections are based upon this research (9-10).

Marathon supplies the frozen food trade with a polyethylene-wax coated paper overwrap for cartons for frozen

fruits, vegetables and fish. This trade calls for a wrap which is printed, can be applied on automatic equipment, is heatsealing, identifies the product wrapped, and has consumer appeal in retail stores. For these functions the waxed paper wrap has proved superior to cellophane and is more economical (14-15). Marathon got into this business by the conscious decision to go into frozen food packaging and to supply a complete unit, carton and overwrap. Marathon's research to determine the material best suited for the job convinced it that waxed paper was the best over-
(11)
wrap. At a later date the polyethylene added to the wax coating increased the sealing strength of the wrap, improved its appearance and its performance at very low temperatures (20° to 40° below zero) (15-16). The polyethylene added to the wax of this wrap is in flake form (27).

The development of this wrap began in the early 40's and gained momentum with the end of material shortages, about 1945. Some of Marathon's business has come from accounts that once used printed cellophane overwraps for frozen food cartons, such as Libby and Seabrook Farms. Birdseye now uses the Marathon type of wrap, having changed from a printed carton with semi-transparent waxed paper overwrap, which was not a very goodlooking package (15-17).

The Marathon printed waxed paper overwrap for frozen food cartons is cheaper than the cellophane overwrap (17).

The acceptance of waxed paper by the frozen food trade is attributable to the merits of the wrap and the economics of the business, rather than any shortage of cellophane (17).

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In the frozen food trade Marathon's major competition comes from other opaque waxed paper wraps (61, 69). Converters competing with Marathon in the production and sale of this type of wrap are: Dayton Specialty, Dayton, Ohio; Pacific Waxed Paper, Seattle, Washington; Western (12)
Waxed Paper, Oakland, Calif., a subsidiary of Crown Zellerbach; Fabricon Products, Detroit; Waxide Paper Company, Kansas City; Kalamazoo Vegetable Parchment Company, Kalamazoo; Nashua Gummed & Coated Paper Company, Nashua, New Hampshire; Pollock Paper Corporation, Dallas, Texas. Milprint, Dobeckmun and Shellmar supply the frozen food trade with printed cellophane overwraps (17-18). The trade name for the Marathon frozen food wrap is "Tyton" (19).

Marathon makes no transparent packages for frozen foods, and Mr. Croy believes that the character of that trade has inclined it toward opaque packaging (59). At one time most printed frozen food wraps were cellophane, but waxed paper is pushing cellophane out to an increasing degree (72-73).

Technical improvements in paraffin coatings have made it possible to dispense with a liner for frozen foods by coating directly the interior walls of the carton. This has entirely eliminated the cellophane liner from the frozen foods trade, with the exception of the Birdseye brand, and has resulted in a satisfactory, low cost package (27-28).

Marathon supplies to the baking trade an opaque waxed paper bread wrapper. This is similar to the wrap supplied by Fabricon, one of Marathon's major competitors in this type of wrap (18).

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Prior to World War II, cellophane was used more widely as a wrap for specialty breads than for white bread, having (13)
gained some of this business from transparent waxed paper. Today transparent waxed paper has a large part of this business in the Southern markets, while in the Western markets specialty breads are more frequently wrapped in cellophane (73).

During World War II, certain baked goods, such as specialty breads, which were normally packaged in cellophane, shifted to waxed paper when Government limitation orders prevented the use of cellophane for that purpose. When these restrictions were lifted, those products returned to cellophane wraps. Mr. Croy believed that the reason for this was that waxed paper could not do the job cellophane could on those products (62-63).

Marathon uses cellophane in limited quantities in the production of window cartons, and laminated to wet strength paper as a meat overwrap for locker plants (74).

Window cartons made by Marathon employ cellophane and cellulose acetate for the window, no other function being performed by the window than that of visibility (88).

Since World War II, packaging for self-service food stores has substantially increased, and Marathon has supplied substantial quantities of flexible packaging materials for this market. Only 7-½% of Marathon's food packaging business comprises transparent wrappers, *i.e.*, cheese wraps, (14)
the remainder is opaque. In spite of a certain increase in the volume of transparent packaging, opaque packaging has increased more rapidly. One of the functions of opaque packaging is to stimulate purchases in self-service stores,

which is a requisite of any package sold through that medium. Recognizing that, Marathon must sell its packaging materials to serve as merchandising aids. Marathon's opaque packages appeal to the eye and have that reputation in the trade (24-25, 31).

Steady improvement has been made over the last fifteen or twenty years in the quality of packaging materials converted by Marathon. Properties of wood pulp and particularly the coatings, equipment and technology employed in converting paper products have been greatly improved. New grades and varieties of paraffin waxes have been developed by petroleum research activites and by Marathon's Research Department, notably, the recent addition of polyethylene to paraffin wax, which greatly increases the gloss and sealing strength of the coating. This polyethylene additive enhances the performance of waxed paper on wrapping machines, improves the appearance and moisture resistance of the package. Inks, paper finishes and printing processes have improved the attractive appearance of printed waxed paper so as to make it more acceptable as a consumer-size container for food products (10-14).
(15)

The phrase "flexible packaging" connotes to Mr. Croy a material sufficiently light in weight and gauge so as to permit flexibility of handling, and connotes the opposite of rigid packaging, such as paperboard cartons. There is a distinct market for flexible packaging materials and there are converters who specialize in it. The market for flexible packaging materials is principally in the prepackaging of merchandise, in the sense that the merchandise and wrapper are purchased as a single unit at retail. Some packaging occurs at store level, as with meat in supermarkets par-

ticularly, which is, for the most part, wrapped in transparent material. Marathon does not attempt to sell waxed paper wraps for this use (20-21, 61).

There were no serious shortages of waxed paper during World War II, only temporary shortages, in fact, waxed paper took over some markets normally supplied by cellophane. About a year ago, the building of waxed paper inventories created an apparent shortage. A few days prior to Mr. Croy's deposition, du Pont advised its cellophane customers that cellophane was available in any quantity demanded (32-33).

Customers buy packaging materials from what is available, using materials that are satisfactory for the products to be wrapped. Waxed paper and cellophane compete with each other and are offered to the same trade (69).
(16)

Prior to 1939, Marathon purchased all its cellophane from du Pont, though quantities required were not very large (34). During that period Marathon received the discount granted by du Pont to converters, which Mr. Croy presumed was granted equally to competitive converters. Mr. Croy did not recall when the discount terminated, nor its exact amount. He doubted that Marathon had a promotional converter contract with du Pont prior to 1939, nor did he recall whether there was a regular converter contract. During this period, Marathon bought du Pont cellophane because it thought this film the best available, based on its performance. This, rather than any price advantage, influenced Marathon to buy from du Pont (34-36).

Marathon purchases cellophane mostly from du Pont, but buys some from Olin Industries. At certain times Marathon has purchased in limited quantities from Syl-

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vania, having had a policy of a multiple source of supply, when possible. The dissatisfaction of Marathon's production personnel with the performance of Sylvania's cellophane rolls in converting operations has accounted for Marathon's failure to purchase in large quantities from Sylvania (6-7, 36, 37). Mr. Croy had no reason to believe that the machine running quality of Sylvania film was any better prior to 1939 than after (64). Mr. Croy has not had sufficient experience with Olin cellophane to judge its quality (31-32).

(17)

Mr. Croy did not know the difference, so far as any du Pont contracts are concerned, between a converter and a fabricator (37). Marathon does not make cellophane straws, cellophane ribbons nor millinery braid, of cellophane (69-70).

Marathon has been reluctant to use the du Pont name and label on converted products. Its effort, rather, has been to build up its own trademark for its "Parakote", and its own name (38, 64). Consequently, Mr. Croy did not know whether Marathon was entitled to use the du Pont label (38).

Marathon is not a substantial advertiser, advertising in the Saturday Evening Post and occasionally in publications like Woman's magazine, and in a limited way in trade journals, such as: Frozen Food Field, Bakers' Weekly, Ice Cream Review, Chain Store Merchandising, Provisioner, and Modern Packaging (25-26).

Marathon has never been interested in the manufacture of cellophane and never gave it a second thought, even at the time of du Pont's public offer of technology and patent licenses two or three years ago. It would have been a

departure from Marathon's business, would have created a problem of obtaining suitable pulp and Marathon would always have preferred to invest its financial resources in other directions. Marathon did not make a pulp suitable for cellophane manufacture. The know-how for producing (18)
dissolving pulp would have been available to Marathon, though no one in the Company has had any experience in its production. Marathon would have had to invest additional funds to produce such pulp (23, 29-31).

None of Marathon's technicians, chemists or salesmen were ever given any du Pont training courses. No such personnel were ever loaned to Marathon by du Pont (78-79). Du Pont has willingly rendered technical assistance to Marathon to the extent Marathon desired it (23).

Du Pont encouraged Marathon to develop and broaden converter uses within the limitations of Government restrictions during World War II (39-40).

It is not Marathon's policy to sell unconverted cellophane (40).

In a general way, Mr. Croy is familiar with the work conducted at Marathon by Robert Heller & Associates in the making of a survey of converter sales for 1949. He believes it was an honest and thorough job and conducted by capable personnel along very high standards, commensurate with the fine reputation of the company. The converters whose sales were comprehended within the survey [listed on page 36 of Defendant's Offer of Proof No. 1] are a representative and substantial segment of the flexible converting industry, both geographically, competitively and from the standpoint of end-uses served (21-23).

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E. C. L.

RETURN TO REPORT FILE-LIBRARY

MANUFACTURE

of

CELLOPHANE

at

BEZONS, FRANCE

by

STE. ANON. LA CELLOPHANE

* * *

AUGUST 22 - SEPTEMBER 29, 1923.

J. F. SMITH

ROBERT E. CULLEN.

P R E F A C E

* * * * *

In APRIL, 1923, Messrs. H. J. White, and Walter Hope made an extensive study of the manufacture of CELLOPHANE at the Société LA CELLOPHANE plant at Bezons, France, and from their observations and the generous assistance given by Mr. J. E. Brandenberger, Directeur Général of the Société LA CELLOPHANE, and his assistants a Report dated May 9, 1923, captioned "DEVELOPMENT DEPARTMENT REPORT ON MANUFACTURE OF CELLOPHANE", was prepared.

In August, 1923, the writers, through the courtesy of La Société LA CELLOPHANE and at the request of the DuPont Fibersilk Company visited the La Cellophane factory in Bezons, France, with the intention of observing particularly methods of operation and the control thereof. The Report mentioned in the first paragraph was available for reading during our visit.

This report is offered as a consolidation of the carefully and capably written report of Messrs. White and Hope, tempered where necessary by more detailed observations in certain manufacturing cycles, and completely new data on others, as well as additional data. Our observations were based on acquiring the operating control mechanical, chemical, and administrative, necessary to start up and operate by May 1st, 1924, a two-casting machine Cellophane plant that is now under construction by the Du ont Cellophane Company at Buffalo, New York.

This Report will be handled in captions as per Index as they represent the cycle of operations.

2534 6063

1. VISCOSE PREPARATION

A - CHEMICAL BUILDING: See Exhibit "A" (Plan of each floor of the Chemical Building.)

The Chemical Building at Bezons is a five-story, brick cement joint building of dimensions shown on Exhibit.

The operations carried out are practically identical with those at Buffalo, viz:- Caustic Solution Preparation, Steeping, Shredding, Alkali Cellulose Ripening, Xanthating, Solution Mixing, Screening, and Cooling.

No operating reports are kept on file. The shift crews' record their operations with chalk on blackboards. The supervisor looks them over and erases them. He may keep a personal record of anything exceptional, but makes no detailed report of anything except index and viscosity of solutions at the mixers.

Operations carried out 6 days a week, from 6:00 A.M. Monday, to 6:00 A.M. Sunday.

STEEPING PRESS ROOM: Two 6 HP, 3-phase, 60-cycle, 1500 r.p.m., AC-motor, gear-driven presses, 1000 liter caustic capacity, and three hydraulically operated, 650 liter caustic capacity, screw presses are installed. Total-5 for four Casting Machines.

Press Room Labor	See Page (10
Weight of Pulp per Charge	50 kg. of 7-10% H$_2$O
Time of Steeping	1 hour (varies to 1½ hours) at least
Total normal cycle	1½ hours
Strength of caustic	24 g. per 100 cc
Temperature of caustic	18 degrees Cent. to 19 degrees Cent. (Hold closely)
Charges per 24 hours	59, 59, 60.67: Average 60 equals 6600 pounds pulp

An alkali pulp charge from a press equals 149-151 kg. Average 26.5% Cellulose 16% NaOH. Two press charge to one shredder charge. Presses are made of riveted steel plate bodies, and cast iron ends. Ends held against sides by four through bolts. Soft rubber gaskets used. Four presses have four subdivisions for paper and 1--5; approximately 24 sheets of pulp used per subdivision. Iron separator plates approximately 3/32" thick are perforated approximately 1" center to center by 3/32" diameter holes.

Press Cycle starting pressing #3	Press--2:56 P.M.	
finished pressing	3:08 P.M.	--12 minutes
started unloadin	3:095	-1 1/2 minute
Finished "	3:12	--2 1/2 minutes
Started inserting paper	3:13	--1 minute
Finished " "	3:14	--1 minute
Caustic turned on	3:15	--1 minute
Press filled	3:19	--4 minutes
		23 minutes

Average 25 minutes

STEEPING PRESS PRODUCTION

Week 8-20 to 8-26 (6 days)-	358 charges	(59.67 per day)	-17,900 kg. pulp
Week 8-27 to 9-2 (same)-	332 charges	(55.33 " ")	-16,600 " "
Week 9-2- to 9-9 (same)-	364 charges	(60.67 " ")	-18,200 " "
Week 9-10 to 9-16 (same)-	304 charges	(50.67 " ")	-15,200 " "

Caustic for steeping is delivered by gravity to presses from a 3'11" deep x 4'7" wide x 9'5" long riveted steel uncovered tank being equipped with live steam and brine.

Press top is 35" above floor level. Press has one plugged drain in the bottom that may be used for washout purposes. In pressing operations caustic is siphoned from press through a 3-inch pipe. The caustic liberated in about first half of ram travel (650 liters at 230 grams NaOH and 12 to 15 grams hemicellulose per liter) is delivered by gravity to caustic make-up room and is butted up for re-use. Caustic liberated during the last half of ram stroke (about 270 liters) contains 30-35 grams per liter hemicellulose, 220 to 225 grams per liter NaOH or more, and is gravitated as follows:

(1) To a 2'4" deep x 5'4" long x 3'3" wide riveted steel uncovered tank on shredder floor from which it gravitates to desulphuring bath. This tank has no steam or brine connection. Overflow travels to tank for caustic wash water.

(2) To a 800-liter tank near chlorinating apparatus. From this NaOH is drawn by gravity to reinforce bleach solution that is being fortified.

(3) To any one of 12 tanks in Viscose Ripening Room where it is diluted by water to 6-10% NaOH and is used for washing tanks, casting hoppers, pipe line, filter, etc.

In operating the ram to press the pulp, the ram is advanced until the pulp is under enough pressure to prevent bagging before the caustic cut is made from "return" to "waste." This is a very indefinite point. Sometimes the ram is almost completely advanced before drainage is begun.

The data given on amounts and analyses of return and waste caustics is for hydraulic presses only. No data on screw-ram presses was available.

Temperature of caustic supplied steeping presses is maintained very closely at 18 to 19 degrees Centigrade by means of brine and steam coils in caustic tank or steeping press floor.

Each press charge before being dumped to shredder is weighed and weight recorded as per steeping press chart given beneath.

STEEPING PRESS CHART
Press #1

No. Viscose Charge	September Date	Time Hours	Weight taken in kg.	Temperature Centigrade
106	3	17 1/2	150	18 to 19 deg.
109		19 3/4	150	
112		22	151	
115		24 1/4	151	
118		2 1/2	151	
121		4 3/4	152	
124		7	151	
127		9 1/2	----	

Steeping press floor has concrete floor and ceiling, is heated by direct steam. Electric lights have vapor-proof globes. No floor drains or sprinklers. Inside of room painted white. Windows are plain glazed with 18" transoms that may be dropped for ventilation.

SHREDDERS:

Steeping Press output is gravitated directly to shredder floor where it is shredded as follows:

1 Shredder charge gives 1 Baratte charge

Number of Werner & Pfleiderer Shredders - 3

Weight of Alkali-Cellulose per Shredder charge	298-302 kg.
Time of Shredding	3 hours
Total Cycle	3-3½ hours
Temp. of Alkali-Cellulose in Shredder held	25° - 29° C.
Temp. of Alkali-Cellulose in Shredder raised to 29° in 30 minutes, finish at 29°. When charge is to be ripened on shredder floor, it is shredded at 27° because shredder floor is warmer than the regular Alkali-cellulose ripening room. Increased shredded temperature lowers solution viscosity and tends to cause brittleness in film.	24° at start

For Labor - See Page 10.

Four uncovered brine pipes - 10° C and two uncovered cold water pipes - 12° C. run lengthwise in the shredder room at ceiling and steam pipes are situated along walls near floor. Shredder floor is kept as nearly as possible at 23° C. The bulb of a recording thermometer, manufactured by "Jules Ricard" - Paris, is dropped through the lid of each shredder. Due to method of bulb entrance, temperature of shredder as recorded might be 2° C. too low. No automatic temperature control apparatus is used in this room. A portable recording thermometer, manufactured by Ricard as above, is used to record temperature of various parts of room.

A recording (Portable) hygrometer is used in the shredder room. No information could be obtained as to its usefulness.

Due to lack of space in A. C. Ripening Room, Shredder Room is used for ripening also.

Two tanks located on the floor are for the following:

1 - A steel tank 2'4" x 5'4" x 3'3" as described under steeping press room, supplies bleach and desulphurings bath of casting machine.

2 - A riveted steel uncovered tank, equipped with brine coils for cooling Seine River water, as well as a well-water connection, supplies cooling water for barattes.

All shredders are belt-driven from a jackshaft; that is belt-driven by a 40 HP A.C. motor. Jackshaft and motor are located on Alkali-Cellulose floor and beltways as well as pulleys on shredders are boxed in, so temperature of A.C. Ripening floor will not be affected. Front paddle of shredder makes 33 R.P.M. and back paddle 17 R.P.M. Paddle motion - reversed every 30 minutes for three minutes.

Shredder Room has concrete floor and ceiling; electric lights are shrouded. No sprinklers or floor drains; no cork or other insulation on inside or end walls; no windows in room and but one door.

ALKALI CELLULOSE RIPENING ROOM:

Shredder charges are dumped by gravity through wooden hoppers to Ripening Room and are distributed each into 4-7/8" wooden boxes 1'7" deep by 1'11" wide by 4'1" long. Boxes have wooden covers.

Uncovered ~~ine~~ lines run lengthwise through room in ceiling and uncovered steam lines likewise along walls at floor. Manipulation of valves on these lines holds temperature of room between 22° C. - 25° C. A portable Ricard recording thermometer gives record of temperature at various parts of room.

Times of ripening in this room average 24 hours at 22° - 25° C. but it varies with pulp used and outside temperature.

It is said that the density and elasticity of the cellophane decreases with an increase in alkali cellulose ripening time. With the pulp in use at Bezons the film begins to get brittle at 48 hours alkali cellulose ripening time.

Room has concrete floor and roof; no special insulation; no automatic temperature or ventilating apparatus; no floor drain or sprinklers. Electric lights have glass shrouds. No windows in this room; one door.

See description of motor and jackshaft that drives shredders under caption "SHREDDERS".

Note:

Copy muddy, nearly illegible.

BARATTES:

Alkali Cellulose is dumped from A C Ripening Room directly into barattes - one baratte charge to a solution mixer charge.

Number of barattes used - 6
Temperature of Baratte interior during xanthation - 19° to 25° C.
Specification - 25° C.
Weight of CS_2 used for baratte charge - 74.8# = 34 kg.
Xanthate time cycle 2½-2¾ - 3-3½ hours.
Complete cycle - 3-3½ - 3½-4 hours.
Weight per baratte charge 298-302 kg.
Labor on Baratte floor - See Page - 10.
Cycle of Baratte is controlled partly by color of baratte charge. A yellow granular mealy charge gives least trouble and quickest solution.

A gauge is installed on one baratte to indicate CS_2 vaper pressure during xanthation - never rises over 400 gms. per sq. cm. (5.7 lbs. per sq. in.)

Baratte is cleaned of any CS_2 fumes by blowing through it for seven (7) minutes an air pressure of 300 g/ sq. cm. (4.3 lbs. per sq. in.) Barattes revolve 1 R.P.M. only.

An aluminum or iron cover, rubber gasketed, reinforced with iron, is used for baratte lid. Eight lid clamps are provided, but only four are used. Warm water is supplied barattes from a hot water heater (a piece of pipe with steam coil inside) located on Baratte floor. A live steam line supplies the heater and is uncovered. Cold water is supplied at 12-12½° C. from tank on shredder floor described under "Shredder." Two CS_2 measuring tanks of steel supply three (3) barattes each. CS_2 is delivered to baratte under 300 g/cm air pressure. See Exhibit "B" for sketch of Barattes. Three grinders (motor driven) running 2500 to 3000 R.P.M. are installed for grinding the xanthate before dumping to mixers.. It is claimed that mixing time can be reduced by one-half if the xanthate be ground. (This has not been borne out by actual practice.) Main CS_2 storage tanks are located in a concrete pit a hundred feet away from Chemical Building. CS_2 is received in drums and is siphoned to storage through a 3/4" diameter iron pipe. CS_2 in storage tanks kept under water seal of 15-20 cm. A hand crank Bowser pump is located on baratte floor and pumps CS_2 from CS_2 storage to measuring tanks. Rubber packing is used in Bowser pump.. Pump leaks rather badly at times about piston gland.

One CS_2 feed tank is now being installed for each baratte. It is a cylindried steel tank about 24" high by 13" diameter with crown headd and dished bottom. Air will deliver CS_2 from this tank to baratte.

Baratte Room has two 3'6" by 6'0" doors and four 3'6" x 6'0" windows on a side. /Ends are closed except for one entrance door. Top 18" of windows may be opened as a transom. Doors and windows are open the year through. No case of CS_2 poisoning known. Men working in this room are old in service and look healthy. No provision for washing hands or face in room.

Baratte floor is not directly heated by steam. No heat supplied.

Electric lights are shrouded. No floor drains or sprinklers. Ceiling and floor concrete, sidewalls brick.

See remarks on viscose mixers for description of screens located on Baratte floor.

BARATTE ROOM CHART

No. Baratte	Sept Date	Mixer Enter	Mixer Leave	Temp C°	Baratte Enter	Baratte Leave	Temp C°	Leaving Baratte Read every 15 minutes.
29	3	1/7½	3/8½		8½	11½	18-22°	
35		1/12	3/13		13	15½	19-23	
40		1/15½	3/17		17	19½	19-22	
45		1/20	3/21		21	23½	20-23	
51		1/24½	4/1		1	3½	21-23	
56		2/4½	4/5		5	7½		

VISCOSE MIXERS:

Xanthate from Baratte is dumped directly to mixer charge per mixer.

Number of Mixers	4
Time of Mixing	4
Total Cycle	4½ hours
Temperature of solution during mixing	19-23°C.
Time of screening through screen	30 minutes.
Screens used (39 mesh upper)	
(46 " lower)	

Labor [illegible] page 1[illegible].

Weight of mixer charge:

	Alkali cellulose -	300 Kg.
	CS_2	34 Kg.
Sent into mixer	(Water	850 Kg.
by a pressure of	(NaOH 22 g/100 cc	90 Kg. varies with pulp
0-500 g/59 cm		1274 Kg.

Charge dumped to mixer from baratte after mixer has had H_2O and NaOH added and paddles are in motion. Lid clamped on mixer. Charge does not leave mixer until completely mixed. After mixing cycle is completed pressure is placed on mixer at 2½-3 Kg/cm and solution is blown to baratte floor where it is discharged into screen.

Box 1 as per sketch.

1'5" long x 1'-2"
screen on bottom-is
viscose flows through
screen shown dotted
Tank 2 is 1'6" wide
above the screen.

Box is 1'4" wide x
deep and is removable.
39 mesh. By gravity
screen in tank 1 to a
in tank 2.
x 2'11" long x 11"
Screen used is 46 mesh.

Screening time is about 30 minutes.
From this box viscose gravitates to 1 of 4 cooling and blending tanks. Here it is cooled and blended 3/4-1 hour. At present one mixer charge goes to one blending tank. Solution is blown by a pressure 2½ - 3 Kg./cm through a 23" disc screen filter 100 mesh to one of 4 receiving tanks in Viscose Ripening Room. From this tank it is blown by a pressure of 2½ - 3 Kg. through a 23" disc - 100 mesh screen filter to any one of the 65 - 3500 liter tanks in the Viscose Ripening Room.

Mixer body - cork lagged and is cooled by brine - 10°C. Each mixer as well as each cooling and blending tank has recording thermometer attached to it.

Each cooling and blending tank 5' high x 5' ø. Body is lagged with 6" sawdust in wood jacket. Brine cools in tank - 10°C. No. steam coils in tank. Range of temperature in this tank 11-21°C. but is kept as near 18°C. as possible.

Water for Viscose mixer charge is kept at a s near 18°C. as possible by only circulating through a centrifugal pump. Steam coils are provided in the tank for use in winter weather.

Temperature of caustic in caustic measuring tank - controlled only by temperature as made up in caustic make up room. No brine or steam coils supplied tank and no thermometer.

Viscose mixer room has concrete ceiling and floor. Floor drains supplied. No sprinklers. Has electric lights, doors and windows. Direct steam heat supplied in winter time. No temperature control for room. Brine and neat viscose pipes insulated. Room is very wet, due to washing filters, dripping pipes, etc.

A viscosity and index test are run for the discharge of each mixer charge. The viscosimeter used at Besons has a smaller opening than that used by Fiberailk Co. at Buffalo. Calibrating the two instruments we find Buffalo readings = .62
French readings

Viscosities at mixer range as follows :

[redacted]

Index is determined as follows:
The % salt solution that will cause precipitation when five or six drops of viscose solution are added. Give the index. A sample from a mixer at Besons gave the following:

60 CC of 20% NaCl solution and 40 C. of H_2O caused precipitation.
Index therefore 12.

Indices at solution mixers range from 10-16 as follows:

[redacted]

Viscosities and indices are determined by foreman of chemical building or a boy from the laboratory.

Sample of Mixer Room Chart:

Viscose	Aug. Date	Mixer Enter	Mixer Leave	Temperature of Viscose at Mixing	Temperature of Viscose at Leaving	Cooling and Blending Hours Enter	Cooling and Blending Hours Leave	Temp. leaving
978	3	20 30	23 30	20°C.	23°C.	23 30	24 30	18°C.
984		23 45	3 45	20°C.	23°C.	4 30	8 30	18°C.
994		5 30	9 30	20°C.	23°C.	9 30	10 30	18°C.

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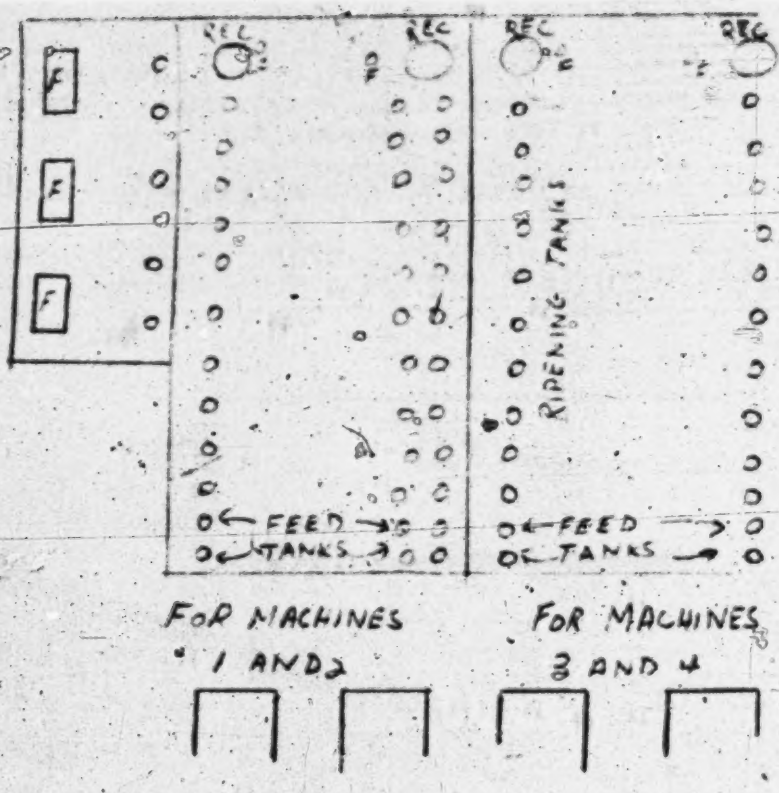

REC
REC
REC
REC
F
F
F
RIPENING TANKS
FEED
TANKS
FEED
TANKS
FOR MACHINES 1 AND 2
FOR MACHINES 3 AND 4

VISCOSE RIPENING ROOM:

as exhibit C.

Viscose from cooling and blending tanks in viscose mixer room arrives in one of four receiving tanks in Viscose Ripening Room at 18°C. From this tank it is forced by 2½ - 3 Kg cm - air pressure thru either one of four - 100 mesh screens, 23" disc filters to one of 65-3500 liter ripening tanks. Here it is allowed to remain undisturbed for it's ripening period normally 4-5 days, until its Indexas per sample is sufficient for casting. Time of ripening depends on kind of pulp used and temperature of outside air; viscose has become sufficiently ripe in summer in 2½ days. Temperature of Ripening room is kept 18-19°C. Room is cork lined sides and ceiling and has concrete floor, well drained, no windows, but two doors. Electric lights are installed. No ventilators. Brine and steam coils supply temperature control; No automatic apparatus provided. Arrangement of air and viscose piping allows viscose from receiving tank to be placed in any tank in the Viscose Ripening Room and from this tank to any feed tank for the machine or to any other ripening tank. Ripening tanks are located in 5 rows of 12 each and 5 new ones starting a 6th row have just been added for moving picture film.

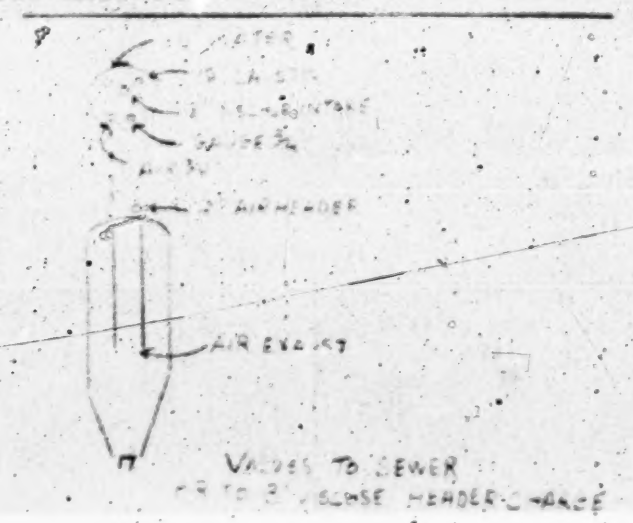
4 plate filters for filtering viscose through cotton and cloth are used in conjunction with the 5 special tanks for cinema film.

One row of 12 tanks is kept for 6-10 caustic for washing tanks or machines. Two feed tanks are located in the end nearest the casting machine of each line of Viscose Ripening Room tanks and are controlled entirely by man at end of casting machine who controls flow of viscose to two casting machines.

Three mixer charges are generally placed in one ripening tank altho frequently but one or two charges are so placed. A tank or a pipe that has held viscose is not allowed to remain empt more than 4 hours unless it is thoroughly washed with caustic before being used again.

Each ripening tank has three test cocks, placed along it's vertical height so that viscose samples may be taken at different elevations. Each also has on to it a three inch viscose connection, 3/4" ø gauge glass (none used), - 1-1/2" ø water, 1-1/2" ø caustic, 3/4" ø air.

Bottom of each tank is conical and has a 3" discharge valve connected to a 3" viscose header.



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CHEMICAL BUILDING

Labor:

The force works 3 shifts for 6 days a week - that is, 6 A.M. - 2 P.M.; 2 P.M. - 10 P.M. and 10 P.M. to 6 A.M.

Force required for each shift :-

1 Supervisor - (Salary) has charge of chemical building and Viscose Ripening Room and Ice Machinery
1 Foreman Rate per hour .....3.5 francs

1 Man) operate steeping presses ..... 2.3-2.8-3 francs
3 Boys) .....1.5 "

1 Man Shredder .....2.3-2.8-3 "

2 Men Alkali Cellulose Ripening Room .....2.3-2.8-3 "

5 Men Barattes .....2.3-2.8-3 "

1 Man Viscose Mixer .....2.3-2.8-3 "

2 Men Viscose Ripening Room .....2.3-2.8-3 "

1 Man Caustic Preparation .....2.3-2.8-3 "

1 Man Operator Refrigerator Machine ..... 2.8-3 "

Shift total.....15 Men, 3 Boys.

- -

In addition to these men work one shift a day only - 8 A.M.-12 M., 2 P.M. - 6 P.M.

3 Men { Handle elevator and deliver paper to steeping presses, clean up chemical building.

2 Men Count paper for steeping presses

2 Men open caustic drums

7 .....2.3-2.8-3 francs

Grand Total - One Supervisor for Chemical Building .... 52 men and 9 boys } per 24 hours day.

The Mechanical Department details one foreman for the maintenance of the chemical building equipment. He has other duties and he devotes time to this work as necessary. He calls mechanics to assist him when required.

All mechanical equipment in Cellophane Plant is oiled by 2 men who have a routine oiling schedule.

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ESSENTIAL MATERIALS:-

Raw materials are not bought on rigid specifications. Each is analyzed and there are certain well-known limits which are observed even though the material is not bought on specifications.

(a) - Wood Pulp:

Kellner Parlington VS (Not bought on specifications)
Analysis available

8 to 10% moisture
0.25% Ash
10-12% Hemi-Cellulose
Beta - 2-3% Dry weight
Alpha - 88% " "
Gamma - 8-9% " "
Copper No. 2.20 to 4.25

Size of bale - 19" wide x 34" long x 20" deep
Size of sheets of pulp 19" x 16"
Samples attached
Bale is wired with thin burlap and weighs 120-216 Kg.
Burlap and wires are recovered and sold.

(b) Caustic Soda: NaOH - (Not bought on specification)
Solvay Process drum caustic
Analysis + 95% NaOH

1-2% Na_2CO_3

1-2% H_2O
variable chlorides (about 1%)

Weight of a drum about 160-180 kg.
Steel drum is cut open and steel casings given to men at plant.

(c) Carbon Disulphide CS_2

Delivered by truck in steel carboys 30" ⌀ x 42" long

Specifications call for specific gravity of
1.26 @ 20°C.
1% Free Sulphur
Drums are emptied in storage tanks by siphoning
About 13000 liters is storage capacity.

WATER:

Water is pumped from Seine River and used for all factory purposes, and is unfiltered for all but boiler purposes, refrigeration machine and glycerine refining. No test other than the following has been made:-

Hardness - 20 points (French Scale).
Carbonates and Sulphates - 0.2 G/100 CC

Four wells have been drilled 8-9 meter deep on the plant. Water rises to within four meter of ground level and an analysis of it gives :

Carbonates and sulphates 0.40
100 cc

This water is used principally for cooling baratttes and temperature control.

Temperature of well water averages 12°C.

Temperature of Seine River Water not obtainable but it never get below 20-25°C.

CAUSTIC PREPARATION

Solid solvay process caustic of specifications given on page 11, is purchased in sheet iron drums similar to that purchased at Buffalo, N. Y., - weight 350-400 lb. each.

Ten of these are placed in one of three open iron rivited horizontal tanks which contain 10,000 liters H_2O each. A concentration is made here of 450 g/ liter.

The solution is pumped by an iron centrifugal pump to one of seven vertical iron rivited tanks, - 8'6" x 15' high, and is mixed with additional water and caustic return from first half of steeping press stroke, until a concentration of 240 g/ liter NaOH is obtained. One of the vertical tanks is kept full of H_2O and new caustic not mixed with steeping press return at a concentration of 220 g/liter. All of the above tanks may be heated and are used as settling tanks; any new batch of NaOH being allowed to settle in them 8-10 hours before it is used.

Each tank charge when completed is tested in the Laboratory.

In caustic preparation room are 4 small vertical tanks, 1500-2000 liters each, which are used to contain caustic returned from last half of press stroke. This is reserve supply only. The discharge from the first half of the ram stroke in the steeping press returns to one of the seven caustic make up tanks above. This caustic solution contains about 280 g/liter NaOH and some hemi-cellulose.

The discharge from the last half of the ram stroke travels to the 4/ - 1500-2000 liter tanks after the tank in shredder floor that supplies disulphuring baths, bleach preparation and wash tanks in Viscose Ripening Room, is filled. This may be pumped to the feed tank on shredder floor when desired. Analysis of this caustic gives 200 to 220 g/liter NaOH and 30-35 g/liter, hemi-cellulose. Overflow from shredder floor feed tanks returns automatically to one of the four reserve tanks in caustic dissolving room.

A sample of caustic from first and last half of ram stroke is tested once a week by Chemical House Supervisor and the results of these tests have set the mark for change of discharge as 1/2 ram travel.

Each vertical heating or makeup tank is sampled for strength as soon as ready for use.

Temperature is not controlled in this room. Caustic for steeping presses is brought to proper temperature in tank in steeping press floor that supplies presses. Caustic is pumped from caustic makeup tanks to steeping press makeup tank.

The return from a steeping press, that is, for reconcentration and for use in feed tank on shredder floor equals 2/3 of the caustic delivered the press. The remaining 1/3 is taken up by the wood pulp.

Force required to operate this room is under charge of Chemical Building Supervisor and is counted in the Chemical Building Labor.

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MISCELLANEOUS

Standard black pipe and fittings are used for all piping in Chemical Building. Brass valves used throughout except for CS_2 and NaOH. Former are iron gate valves, latter iron plug-cocks. Soft rubber packing used generally in caustic, steam and CO_2; hemp on water.

Standard grades of American oils are used for lubrication. "Gargoyle," etc.

C A S T I N G M A C H I N E

CASTING MACHINE

See Blue Print attached for details, Exhibit , Also photograph #

GENERAL & BUILDING CONSTRUCTION:

Blue Print, Exhibit , gives size of room used at Bezons for four (4) casting machines.

Walls of building are of brick, painted white; tile roof laid loosely on wooden purlins. Tiling is removed in summer to increase ventilation and release heat and fumes. Roof, two-thirds plastered under tiling, is supported by two trusses, one end anchored in brick wall and the other rests on post plate located on center line of room. Skylights located over casting machines are of glass painted white. Floors are of concrete. 8 lb. lead is placed over concrete under wet end of 3 and 4 machines. Columns and floor are badly eaten by bath waste under machines 1 and 2. Drain, covered by perforated concrete blocks, is located in floor midway between operating sides of each two casting machines. Discharges to sewer from tanks enter side of drain, flow over concrete floor to drain. This necessitates workmen wearing wooden shoes.

No ventilation equipment except that due to fans located in hoods over various tanks, and to tile being taken from roof in summer. Room is heated by steam and lighted by electricity. Water, steam and incoming process pipes reach various machines from uncovered headers among roof trusses. Condensation drops on workmen. Returns to Bath house leave machines on operating side and travel under working platform to return trench in floor, by which they reach proper bath tank in Bath House.

Floor about and at end of dryer end of each Casting Machine is of solid concrete, no drains. Fan and air duct pits must be pumped out by hand as they contain no drains.

No sprinkler system or automatic fire protection installed.

Machines motor-driven, as well as fans, AC current being supplied. One 40 KW motor drives both wet and dry ends of each machine. Elevated, slat, wooden working platforms along each side and the front of each machine.

100 cu. m. H_2O required per 24 hours per machine. Two machines, Nos. 1 and 2, are run on ammonium sulphate bath; and two, Nos. 3 and 4, on acid sulphate. No. 3 machine is the last built and has been in use only four months. American machines will be built from it. No. 4 machine is about 14 years old and has been changed greatly from time to time.

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CASTING MACHINE

GENERAL OPERATION

Viscose in the Viscose Ripening Room that has reached the proper index for casting is delivered to one of two feed tanks located at the end of that Ripening Tank row nearest the casting machine. After it is blown to a feed tank, the air pressure on it is controlled entirely by manometer operator in the casting machine room. He has separate air lines to each feed tank and manipulates the pressure as best suits the flow of viscose to the particular machine he is controlling. One operator controls the viscose flow to 2 casting machines and at Nezona has 4 feed tanks - 3500 liters each - under his direction. An air pressure of 2½-3 kg. per sq. is used on the feed tank. Pressure when applied forces the viscose through a 3" iron feed line up through 1 of 2 - 3" disc screen filters (see sample). Either filter may be used, one being cleaned while the other is used. See photograph . The flow up through the filter forces all air ahead of the viscose and it is relieved through a plug cock located at the high point of the pipe bend above the filter. During operation this valve is allowed to drip as it vents air in viscose. The viscose flow is next through one of two 12" disc screen filters (see sample), one being located on the riser to either end of the tremie or casting hopper. The flow is up through these filters, both of which operate simultaneously, and at the point where filter riser pipes join axis of casting block, a vertical plug cock is inserted in each pipe. This during operations is opened slightly so as to allow any air that has escaped the plug cock in the larger or 23" filters to escape.

When operating, the average pressure on the viscose on the casting block runs from 50 g/sq.cm. to 300 g/sq.cm.. On the feed tanks air pressure varies from 300 g/sq.cm. for clean screens to 5,000 g/sq.cm. for dirty screens.

Air pressure is always reduced when trouble is experienced with film flow. 12" filters are cleaned once a shift; and 24" at least once a shift or oftener. Where small filters are cleaned, casting hopper flow is through the other 12" filter. Filters are cleaned by lifting top with traveling chain hoist, brushing screen and filter plates thoroughly with an ordinary scrub brush, flushing detached parts with water and reassembling.

A manometer, consisting of a piece of rubber tube to a U glass tube and another piece of rubber tube to a 6" dial pressure gauge 0 to 500 g/sq.cm., located over the casting hopper hood in each machine, is the guide for the man who controls the air pressure on the Viscose Ripening Room feed tank and casting hopper. The casting block operator signifies by a wooden homemade pointer on the dial of the pressure gauge, the pressure he desired on the casting block, and the air pressure operator, by manipulating his air pressure on his feed tank, tries to hold the pressure on the casting block to the mark desired.

Pressures observed at Viscose Ripening Room tanks for different films at casting block are as follows:

Thickness of Film	Pressure Kg./sq.cm.	% Cellulose	Pressures Observed on Casting Block
.02 mm.	1.0 - 1.5	7.5	
.03	1.0 - 1.5	7.5	
.05	1.0 - 1.5	7.5	
.08	1.8 - 2.0	10.0	
.12	1.8 - 2.0	10.5	
.03	1.3	6.3	150 g/sq.cm.
.02	1.5	6.3	155 "

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2. CASTING MACHINE

GENERAL OPERATION

Note: Either of two casting baths, ammonium sulphate-sodium sulphate or sulphuric acid-sodium sulphate, is used in tank 1 as a coagulant. Each is treated separately hereafter.

In starting up a casting machine, this procedure is followed:

1. Wash and thoroughly clean all tanks, filters and casting blocks with 8-10% NaOH, and brushes if necessary. See that casting block lips are true and casting machine rolls unscarred.

2. The rolls of the casting machine are next started rotating so that the film will have a speed of 12 to 15 meters per minute.

3. See that all baths are at proper temperature and composition.

4. Air pressure is applied to proper Viscose Ripening Room Feed Tanks and Viscose of proper index and viscosity is forced thru two sets of filters, above described, to casting block. All petcocks above screen filters are cracked to allow air in viscose to escape before reaching casting block. Casting block is filled full of viscose ~~and air~~ in block escapes through a 2" nipple which is uncapped for this purpose. After hopper has been filled with viscose to top of pipe nipple which has been uncapped, this nipple is capped tightly again; then viscose is forced 2" by air up in reservoir with sight glass on top of casting block for manometer attachment. The lips of this casting block have been tightly closed, either on a piece of "calico" block lip wide" by 8-0" long (see sample) that has had one end inserted evenly in the hopper for 3 to 4 inches, or without the "calico." Care should be taken in placing the starting cloth between hopper lips to see that it does not bunch at the ends of the lips: this might bend lips at thispoint and cause film to have bad edges.

5. Casting block is adjusted so that one end is 1/4 to 5/8" higher than the other in H_2SO_4-Na_2SO_4 bath. This causes H_2S, formed when viscose touches bath, to drain to one end of casting block for discharge and not be caught by traveling film. Gas bubbles caught between traveling film and rolls cause film to stretch at point of contact and gives a wavy, unsatisfactory surface.

6. Casting block lips have so far not been coagulating bath. Casting block operator calls a casting machine operator forward and the two, using both hands at the same time, open from the outside towards the middle at the same time and at a fixed rate, a quarter turn, each of the 5 lip control wheels on the casting block, just sufficiently to allow calico to be pulled out of lips about 1 inch. Casting block is tipped down so that the lips enter the coagulating bath and calico is passed under premier roll and up to idler rolls leading to top tank roll of #2 tank. The casting block is tipped into casting position, that is, front face at bottom is 2 inches nearer the front of tank than top. Block operator signals manometer man for pressure and with assistance of machine operator opens lips slightly more, so calico soaked in viscose starts moving from lips into bath; viscose naturally follows. Simultaneously, machine operators have attached a threading cloth to forward end of calico and start feeding it through the second bath of the casting machine. This places a slight tension on the film formed at the lips of the casting

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GENERAL OPERATION

block, causing it to fold half round the premier or casting roll located in the coagulating bath; and starts the film on its travel through the casting machine.

Some casting block operators prefer not to bother with the use of the calico starting cloth for either bath. They call to their assistance two machine operators, place casting block in position and open jaws as above described. The three men, each using two hands, grasp coagulated film as it leaves the lips of the casting block and feed it to the premier roll that revolves under casting block. They then catch the film as it leaves the premier roll and thread it by threading cloth through casting machine baths.

Film cast in H_2SO_4-Na_2SO_4 bath is more quickly coagulated than that cast in $(NH_4)_2SO_4$ bath and is accordingly more easily handled at the casting block.

Continued immersion of hands and arms in acid bath cause them to redden. They should be washed in water promptly after immersion. Grease with oil or vaseline if skin is irritated.

Immersion in $(NH_4)_2SO_4$-Na_2SO_4 bath causes the skin and finger nails to become black. Wash hands first in a paste of bi-carbonate of soda and bleach bath solution and immediately thereafter in water. This will remove all discoloration. A little vaseline rubbed into the hands after washing is good.

Rubber gloves are not used in France for handling bath.

The starting of flow of viscose through casting block lips is the same for both types of coagulating baths.

2. CASTING MACHINE

GENERAL OPERATION - Film Color

Film, as it emerges from the H_2SO_4-Na_2SO_4 bath of tank No. 1 is a yellow-slightly green color. Casting block operator watches it here closely for:

1. Color - This is controlled entirely by viscose supplied to the hopper and bath. A pale yellow with greenish cast is the best. If film is too white and contains air bubbles, cut down acid supply to tank No. 1.

2. Edges - The outside edges of the film should be thicker than the middle for both the ammonium sulphate and acid sulphate casting baths. The thickened edges taper from the edge toward central normal thickness for about 2 inches on each side. Actual tests show edges for .04 mm. equal .05 mm.; and for .02 mm., .03 mm. This edge ribbon is very important as it gives strength to the film, while in its soft stage enables the film to flow better, follow the rolls true, and prevents film from breaking. If an edge shows a ragged spot or a slight break, cut out the piece promptly or the floating lip of the tear will wind about the first roll and cause the film to break across its entire width. Bad edges are caused generally by unclean hopper lips; distorted lips; uncontrolled viscose composition; a rough or uneven casting machine roll. It is best if bad edge trouble continues, to change hoppers, providing viscose tests properly. Should edges, as film emerges from tank 1, be too thick or thin, hopper is provided with regulating screws along the end of the back lip.

3. Body of film - From 20 to 30 minutes after film leaves casting machine lips it is wound up dry at the end of dryer. It is here tested by laboratorian and the jaws of the hopper are opened or closed by their 5 control wheels, to suit requirements.

A small variation in film thickness may be controlled by air pressure in casting block. Block operator tells manometer man just what to do.

If film varies in narrow continuous strips, it is controlled by separate wheels controlling the lips.

The opening between the lips of the casting hopper is as follows: .10 mm. to a .01 mm. finished product thickness. In other words .25# or .02 mm. will have .20 mm. body thickness at casting block; edge thickness .30 mm..

4. Gas bubbles - These form only in the H_2SO_4-Na_2SO_4 bath and are caused by coagulating bath containing too much acid. See Paragraph p.# on acid bath for further details. Should bubbles form shut off H_2SO_4 flow slightly and increase water flow in tank 2B.

5. Stripes or uneven ribbons in film - Never use such film for dyeing as it gives a varied colored product.

This is due principally to small pieces of coagulated film hanging to lips of hopper. The character of the viscose solution also has marked bearing. To overcome difficulty, rock casting hopper back and forth several inches, always keeping lips in bath. If this does not correct the difficulty, clean jaws by inserting a brass gauge as per sample. The necessary portion of the film sheet is cut away to reach the stripe. This is done by placing

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5. knife parallel with film flow in idler roll at entrance to tank 2 and moving knife in from edge toward middle to where stripe is. Knife is held in this position until stripe is rectified and is then moved back to the same outer edge of film from which entry was made. Flow of film is by this method kept continuous.

An unripe viscose, over 3.5 to 4, tends to produce a streaked film.

6. Holes in film - Due to a hard viscose flake or foreign substance between, at mouth, or at entrance, of casting block lips. Treat exactly as (5). If unable to correct (5) or (6) defect, it is better to change casting blocks, clean thoroughly, and adjust the defective one.

Index of viscose solution as well as cellulose content has a controlling effect on the character of film produced. The lower the index, the better class film that is cast and the less tearing during casting. Cellulose content should be held to a fixed percentage described on page 30.

Three operations are necessary to thread a casting machine. A threading cloth and hook, described in detail hereafter, are used. One operator (#1) folds about 6 feet of the starting cloth back and forth in his hand. The other end of the cloth is being threaded over rolls by second operator (#2) with threading hook; and just before threaded cloth places tension on that folded in his hand, he releases it and uses the necessary part of the released portion to tie a knot in the flowing film which a third operator (#3) has been feeding over side of casting machine to a waste pile. The film is cut by a knife or torn by hand just ahead of knot of threading cloth, before cloth places tension on film. (#2) operator secures a second threading hook and mates up with #1 in the threading operation as it requires two men to thread from one tank to the next through squeeze rolls. As soon as dryer is reached with film, a dryer operator threads the dryer rolls by hand and winds the dry cellophane on a cardboard roll - 3½" x 44" - at the end of the dryer. The dryer foreman weighs each roll of 1000 meters and places a signed tag in the end of the roll that shows - Date, number, quality, width, length, weight and remarks. Weighed rolls are stacked in racks at the end of the casting room and are taken from here by store room force for either stock or distribution.

A record of the rolls placed in rack for store room is kept in a ledger at end of dryer by foreman and from this a daily report of output is made up.

CASTING MACHINE

MANUFACTURE OF MACHINE: See exhibit .

The construction of casting machines for cellophane is based entirely on experience. When cellophane manufacture was first started but one machine was operated. It was slow speed and handled dyeing as well as casting: As the production schedule required a second machine, the experience gained in the operation of the first was incorporated in the changed construction of the second. The result is of the four machines in use at Bezons, France, no two are alike in speed and arrangement. Progress has been made and is being made. No. 3 machine, from which American patterns are being made, embodies all of the latest proven experiences of Mr. J. E. Brandenberger, Director, Societe la Cellophane, at Bezons. No. 3 machine was constructed with top rolls elevated sufficiently above bath level that operator could thread rolls without use of threading fork. It was thought that film would be better washed and cured by this outlay also. Experience has proven that top rolls resting directly on top of lip of tanks is better, and all top rolls have been brought to level of the two shown in tank 14. It is also equipped with a variable speed drive for three different sections of the top rolls. This has been proven unsatisfactory and it is now decided that casting machine and dryer should both run at the same speed, the only difference being at premier roll and squeeze rolls marked in sketch. Here the proper speed reduction is automatically taken care of by gear arrangement. The speeding-up or slowing-down of casting machine and its dryer should be made only at one point and that is at the speed change in the drive set of the main drive 40 KW AC Motor. Later on we believe that a variable speed DC motor will drive the casting machine very advantageously. There is a special speed change for the dryer, but dryer should be synchronized with casting machine and dryer speed change locked.

The same number of tanks are used for ammonium sulphate bath as for acid sulphate. No. 2 machine is used for ammonium sulphate and is considered by Mr. Brandenberger the best for cinema film. Here the top rolls in the coagulating tanks rest on the bottom rolls so that the film in its passage is continuously supported. The level of the bath should be such that it is above the point of contact of the film on the climb and top roll. This prevents air being pocketed between film ad roll. The first three tanks are larger also than those of the acid bath as film is more tender and requires longer bath contact.

Exhibit E is a longitudinal section of #3 casting machine at France. Casting block is shown on ted wrong way, however, as it is sketched too far toward front of tank.

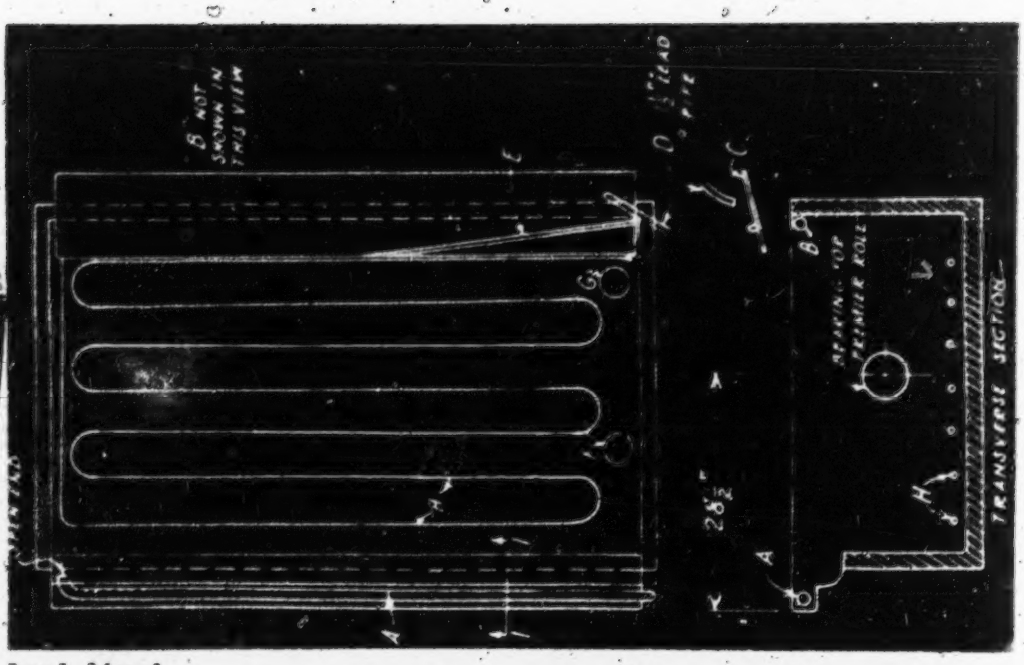
The construction of each tank and other details are given herewith.

Tanks Nos. 1, 2 and 3.

There tanks differ in essential details in the handling of each of these baths. The general details will be given as applicable to the two baths and the special items to be used for a particular bath will be noted. See sketches.

2. CASTING MACHINE

Tank #1



1. Wood tank, lead lined.

2. Size: Length, 1300 mm.: width, 2060 mm.: depth, 565 mm.: capacity, 490 gallons.

3. Rolls: Premier roll on which cellophane is extruded from casting block is completely submerged in either of two coagulating baths. It is made of acid-resisting bronze, covered with regulus metal (80% lead, 20% antimony); and has ends, journals, and bearings of acid-resisting bronze; two idler rolls made of steel tube covered with hard rubber, cast-iron ends, shafts of steel rotating in cast-iron bearings are placed above and lead film from premier roll to the rolls of Tank 2 of the casting machine.

4. Two 3/4-inch lead pipes are located along the top front and back of this tank, 5/16" diameter perforations 2" center to center. Through the forward pipe the circulating ammonium sulphate bath is supplied while the back pipe conducts to the tank the non-circulating bath acid. A 1 1/2" pipe "D" supplies 26° Beaume acid for the acid sulphate bath.

5. A 1½" lead overflow pipe C, bell for 18" from the bottom of the tank, conducts the overflow from either bath to either the coagulating bath house or the sewer. A 2" plug washout F is used for cleaning purposes and for drainage to either the coagulating bath house or the sewer.

6. A six-leg 3/4" in diameter, lead heating coil lies on the bottom of the tank and live steam courses through it when desired. The use of it is necessary in starting up either bath if the temperature of the solution be below 20-30° Centigrade.

7. A ventilating hood #1 (see exhibit #E) extends over this tank to the casting block; exhaust fan in the fume stack throws to the atmosphere the H_2S liberated in the coagulating of the film. At the casting block this hood is 2½' above it and sliding doors are provided so that when the machine is running perfectly, the 2½' opening may be closed.

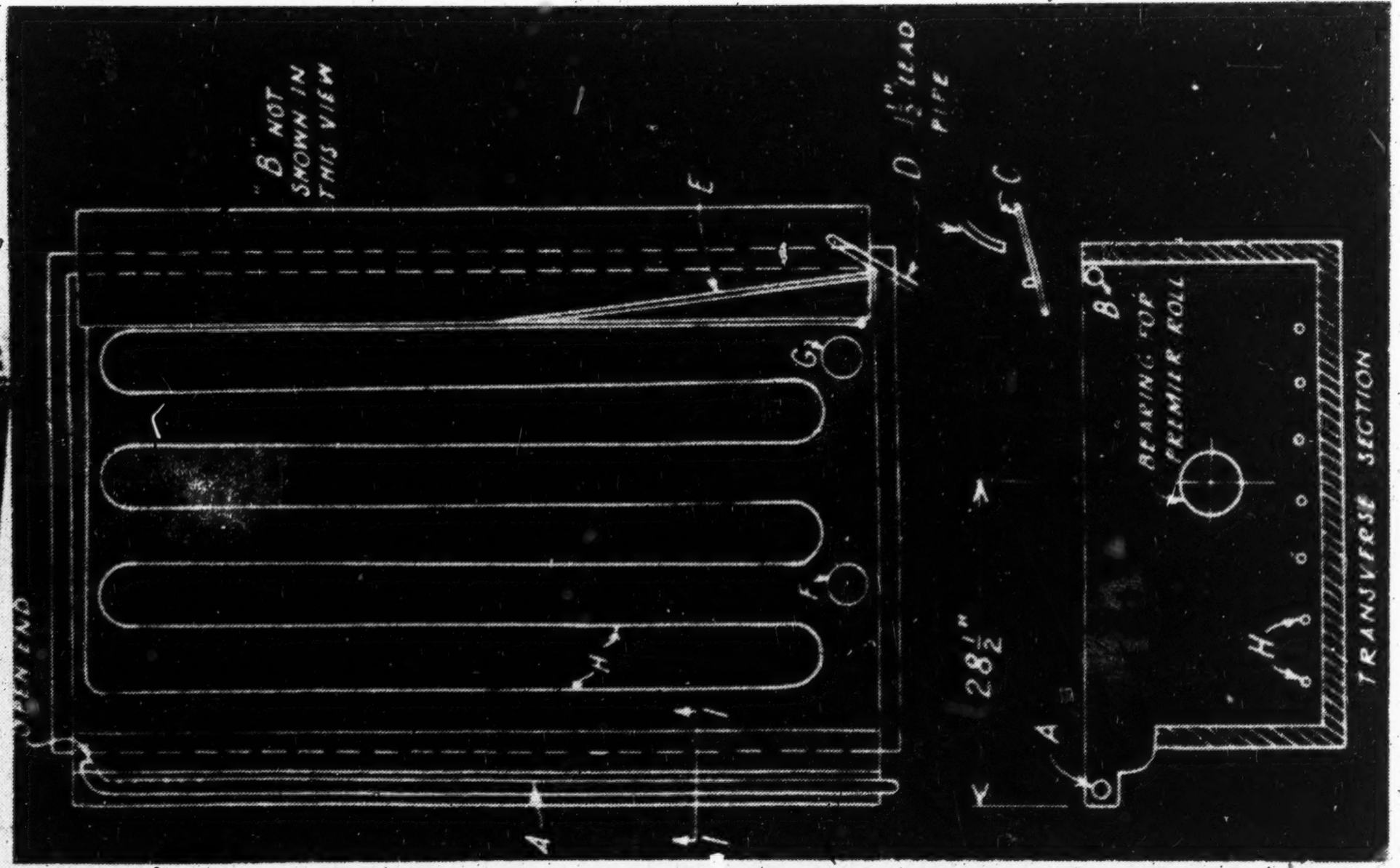
8. When the acid bath alone is used a 2" lead pipe connects Tank 1 with Tank 2, its location being 12" from the bottom of the tank, and 18" from the operating side. Pipe is left open only in the acid bath, and when the ammonium bath is run it is plugged with a wooden plug.

9. A lead apron carries run-off from squeeze rolls back into Tank 1.

10. An 1½" water connection rubber hose end is dropped from above on machine rest between Tanks 1 and 2.

CASTING MACHINES

Tank #1



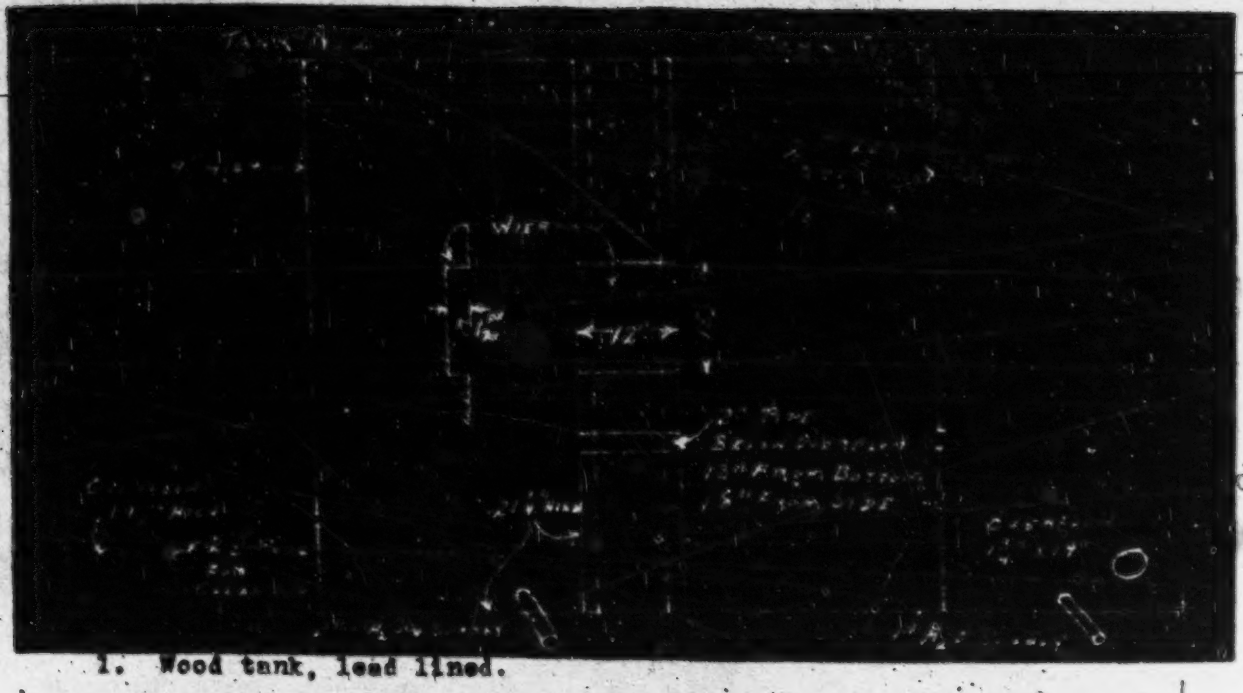
1. Wood tank, lead lined.

2. Size: Length, 1300 mm.: width, 2060 mm.: depth, 565 mm.: capacity, 490 gallons.

3. Rolls: Premier roll on which cellophane is extruded from casting block is completely submerged in either of two coagulating baths.

2. CASTING MACHINE

Tank #2



1. Wood tank, lead lined.

2. Size: Length, 2180 mm.: width, 2060 mm.: depth, 700 mm.: capacity, 832 gallons.

3. Rolls: Bottom rolls are seven in number, and are steel tubes, cast-iron ends, covered with regulus metal. Journals are of acid-resisting bronze, and rotate in bronze boxes. Top rolls are eight in number of the same construction as the bottom ones with the exception that the shafts are of cold rolled steel and rotate in cast-iron bearings. The idler roll between Tanks 2 and 3 on machine 3 is at the same level as the top roll, and is made of the same material. In a new machine the idler should be of the same size and material, namely, hard rubber, as that between Tanks 4 and 5.

4. Supply to Tank: A 2" lead line for sulphuric acid 66° Beaume supplies Tank 2, Compartment B, in the ammonium sulphate bath when required, and while it should not be used except in emergency in the acid sulphate bath, we have seen it so used when the bath in this tank did not contain its acid content.

5. A 2½" belled top lead overflow is located as shown 19½" above tank bottom in 2A and a plugged 2½" cleanout is also available. The flow from both of these outlets returns either to the coagulating bath house or is discharged to the sewer.

6. No heating coils are supplied this tank. The temperature of the Seine River is such that the bath make-up rarely ever is of a lower temperature than 20° C. Inasmuch as the Niagara River's temperature is frequently 0° C., coils here will be necessary for the American outlay.

7. Fume hood #1 discharges through ventilating fan fumes given off by this tank when in operation.

2. CASTING MACHINE

Tank 2 (Cont'd)

8. Tank 2 is divided as shown by a lead partition 19" high. Thru it in the acid bath only a 3" hole 1½" from the bottom and 16" from the working side is left open. In the ammonium sulphate bath this hole is plugged.

9. A wier, shown on sketch at beginning of paragraph, with a slope of ¾" from Tank 3 to Tank 2, unites these two tanks. The trough of it is 19-3/4" from the bottom of the Tank 3 and 20" from the bottom of Tank 3. Same is used only in the ammonium sulphate bath, the flow being from 3 to 2. A 2" lead pipe 13½" from the bottom of Tanks 2 and 3 and 18" from top operating side connects these two tanks when acid bath is used, the flow being from Tank 3 to Tank 2. When ammonium sulphate bath is used, this opening is plugged.

10. A 1½" hose end water line is drawn from above on machine post between Tanks 3 and 4.

11. Use lead arrons between Tanks 1 and 3.

Tank 3

See sketch at beginning of Tank 2.

1. Wood tank, lead lined.

2. Size: Length, 1160 mm.: width, 2060 mm.: depth, 700 mm.: capacity, 832 gallons.

3. Rolls: Same as in Tank 2.

4. A 3/4" lead pipe for water supply runs along the Tank 4-end of Tank 3. It has an open end and is drilled with three ¼" holes evenly spaced along its length. Water is added through this pipe to 3-D as desired for either bath.

5. A 2" bell top lead overflow 19" from the tank bottom feeds to sewer. A 2½" plug clean-out located in 3-D leads to sewer.

6. Remarks covering heating coils as at Tank 2.

7. Fume hood #1 acts as for Tank 2.

8. A lead partition 20" high divides Tank 3. In the acid sulphate bath a 3" hole located as in the lead partition of Tank 2 is kept open, the flow being from 3-D to 3-C. When ammonium sulphate bath is used, this hole is plugged.

9. Squeeze rolls: Soft rubber top, hard rubber bottom, are inserted between Tanks 3 and 4.

10. Use lead arron between Tanks 3 and 4.

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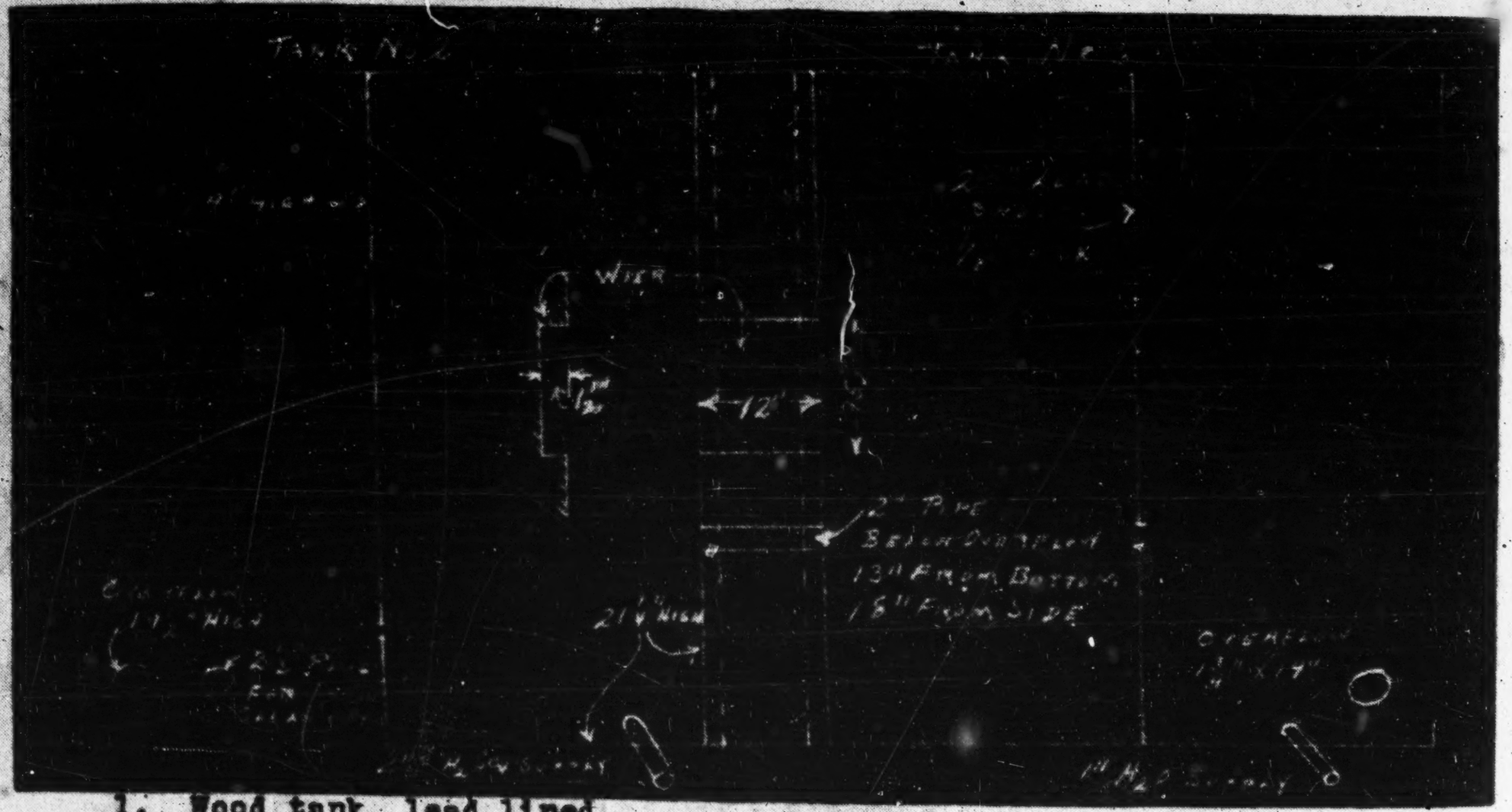
2. CASTING MACHINE

Tank #2



1. Wood tank, lead lined.

2. Size: Length, 2180 mm.: width, 2060 mm.: depth, 700 mm.: capacity, 832 gallons.

3. Rolls: Bottom rolls are seven in number, and are steel tubes, cast-iron ends, covered with regulus metal. Journals are of acid-resisting bronze, and rotate in bronze boxes. Top rolls are eight in number of the same construction as the bottom ones with the exception that the

Tank #4

1. Wood tank - not lead lined.

2. Size: Same as tanks 2 and 3.

3. Rolls: Same as tanks 2 and 3.

4. Supply to Tank: 1½" cold water 1" live steam. The steam and water lines enter tank as shown on sketch, behind 1" baffle perforated with 3/4" holes 10" center to center. The steam line is flared toward the center of the tank and slightly flattened so that the steam is projected diagonally across the tank toward the bottom. The chattering of these steam lines when used should be done away with and for the American machine, due to the lower temperature of our supply water, steam coils have been used.

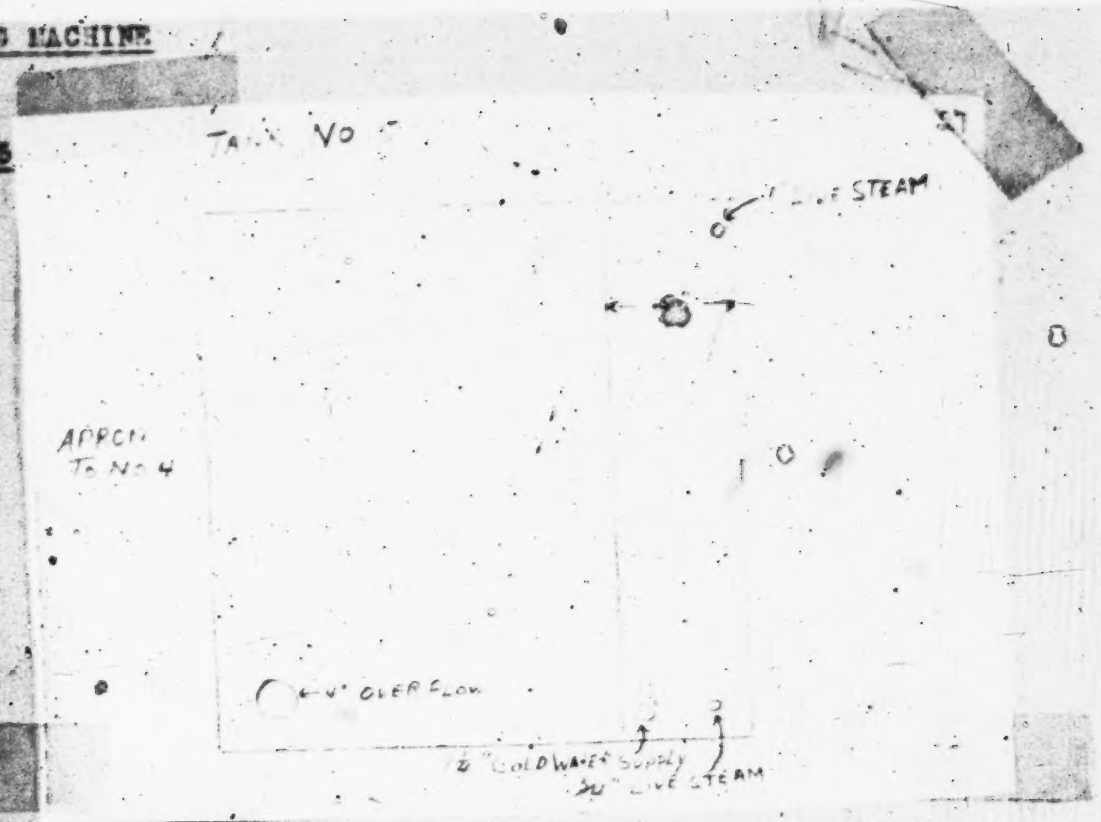
5. Overflow and clean-out to drain.

6. No hood.

7. Apron between 4 and 5 lead covered.

2. CASTING MACHINE

Tank #5



1. Wood tank, not lead lined.
2. Size: Same as 4.
3. Rolls: Same as 4.
4. Cold water and steam supplied as in 4.
5. 4" overflow bell top 19½" off bottom. Flow from this and clean-out plug goes into sewer.
6. #2 Fume hood begins over this tank and conducts vapors to atmosphere.
7. Lead apron between tanks 5 and 6.

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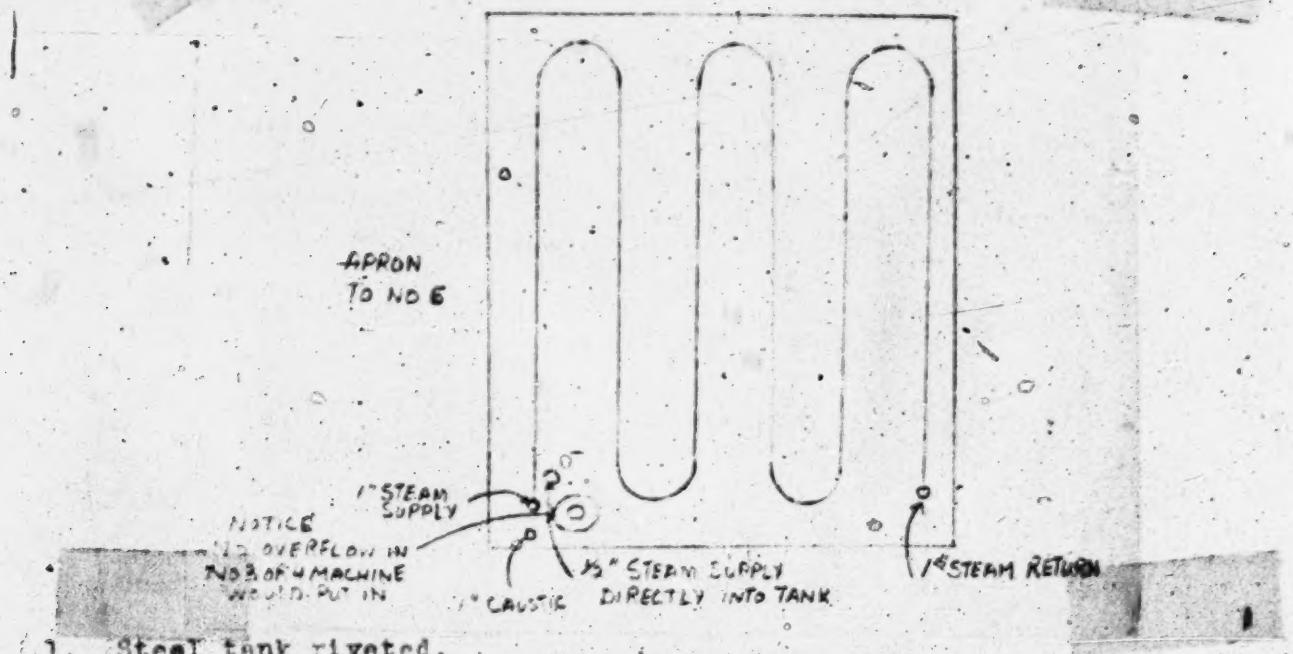
2. CASTING MACHINE

Tank #6

See sketch.



1. Steel tank riveted.

2. Size: Same as #5.

3. Bottom rolls are 7 in number, made of steel tubing with cast-iron ends and cold rolled steel journals. Cast-iron bearings used. A hollow cast-iron roll is being developed in France to replace the above construction; caustic works its way through the joints at ends of rolls and fills inside of tubing. A hollow cast-iron casing is expected to do away with this trouble.

   Top rolls are 8 in number, of same construction as above mentioned.

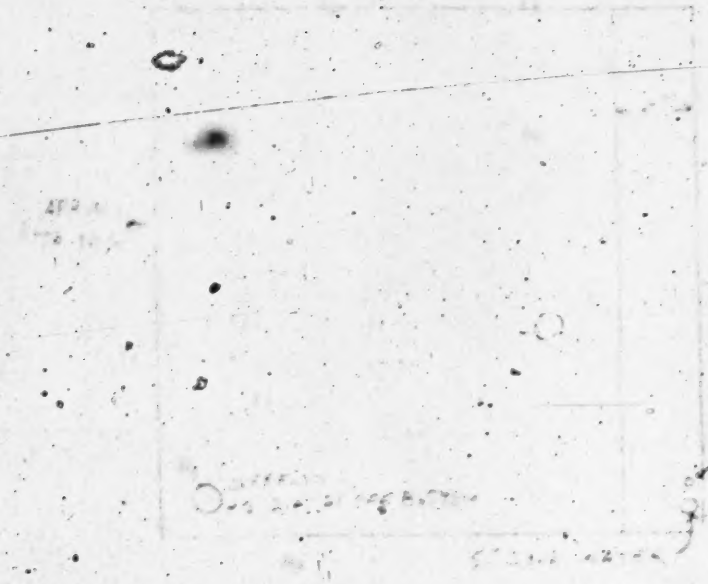
4. A 1" NaOH line conducts caustic from supply tank located on shredder floor of the Chemical Building, and distributes to the operating side of Tank 5-end of Tank 6. A 6-leg 1" iron return steam coil is placed on the bottom of Tank. In addition a ¾" iron steam pipe blows directly into the tank when desired. See sketch.

5. No overflow is allowed for in this tank, although it is desirable to have one. Tank is allowed to overflow on the floor.

6. Tank covered by #2 hood.

7. The apron between 6 and 7 is made of a light gauge black iron. The caustic has practically destroyed it, and a cast-iron apron has been recommended for use in the American machine.

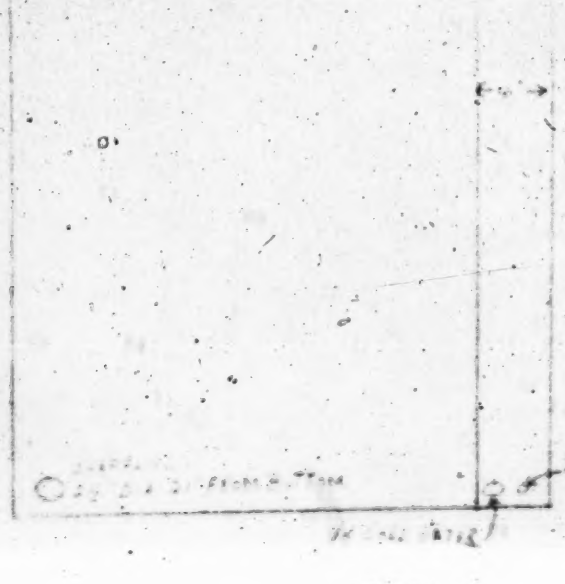
Tank #7



1. Steel tank; rivoted.
2. Size: Same as 6.
3. Rolls: Same as 6.
4. Supply 1½" cold water & /4" live steam, blowing directly to tank behind wooden perforated baffle. A steam coil is recommended for this tank on the American machine.
5. Bell top overflow to drain 21" from bottom; clean out opening likewise.
6. Covered by #2 hood.
7. 1½" hose end water connection from above between Tanks 6 and 7.
8. Apron between 7 and #8 same as between #6 and #7.

Tank #8

Identically the same as Tank 7. Same recommendations apply. Apron between #8 and #9 same as between #7 and #8.



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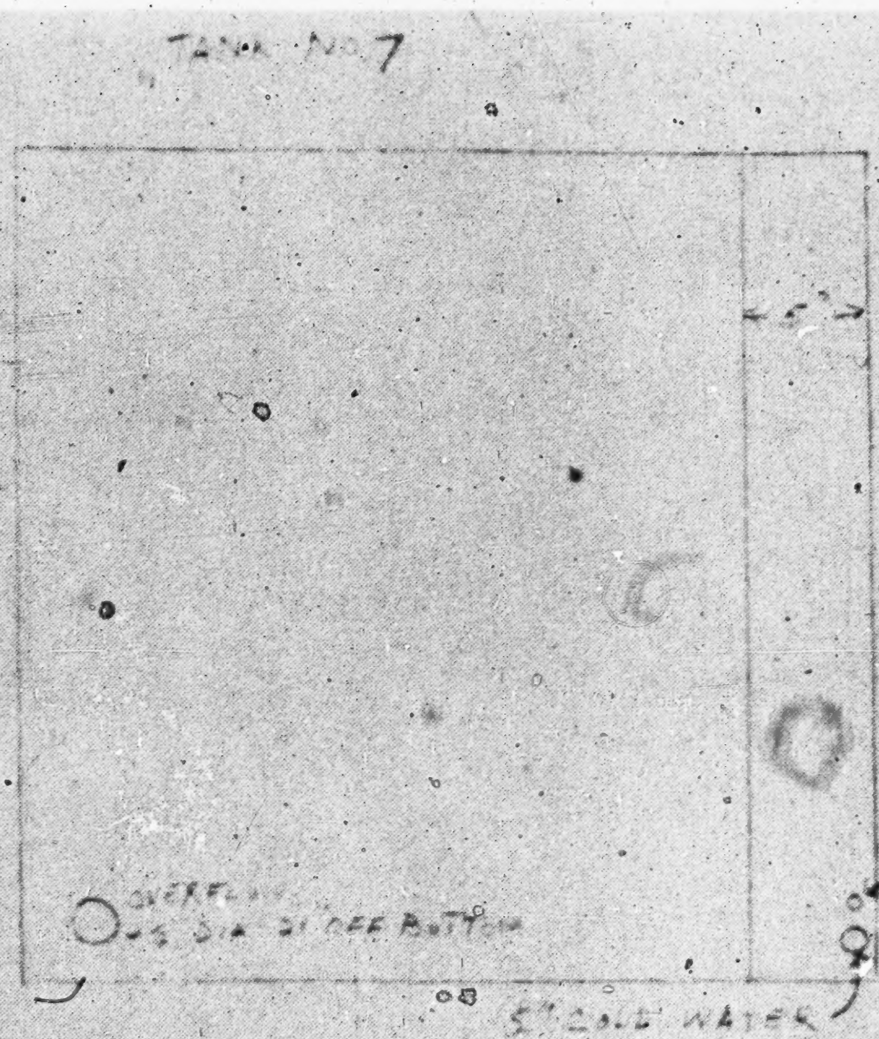
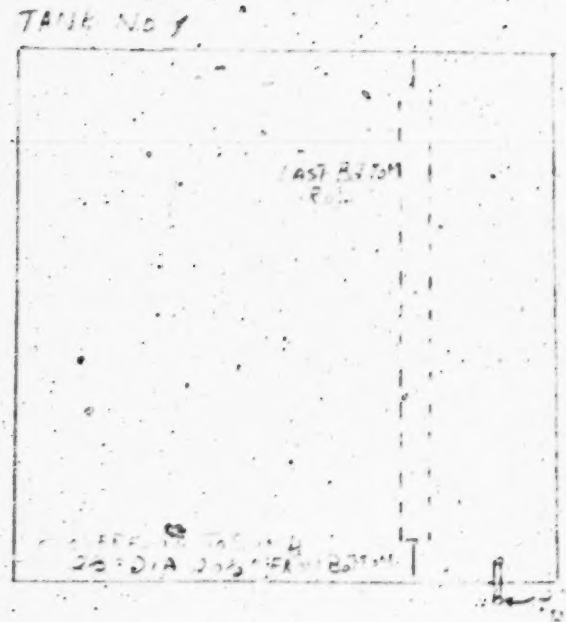
Tank #7



1. Steel tank: riveted.
2. Size: Same as 6.
3. Rolls: Same as 6.
4. Supply 1½" cold water 3/4" live steam, blowing directly to tank behind wooden perforated baffle. A steam coil is recommended for this tank on the American machine.
5. Bell top overflow to drain 21" from bottom; clean out opening likewise.
6. Covered by #2 hood.

CASTING MACHINE

Tank #9



1. Wood Tank, lead lined.
2. Size: Same as 8.
3. Rolls: Number and style same as 8.
4. Supply: A 2" dead bleach line from coagulating bath house supplies tank on operating side of Tank 10 corner. See sketch.

   A 2½" bell top overflow 20¾" above tank bottom leads to coagulating bath house or sewer. Clean out leads likewise.
5. No steam coils.
6. Supply no steam or heating to this tank.
7. Covered with #3 fume hood.
8. 1½" hose and wash line from above on machine support between Tanks 9 and 10.
9. Lead apron between tanks 9 and 10.

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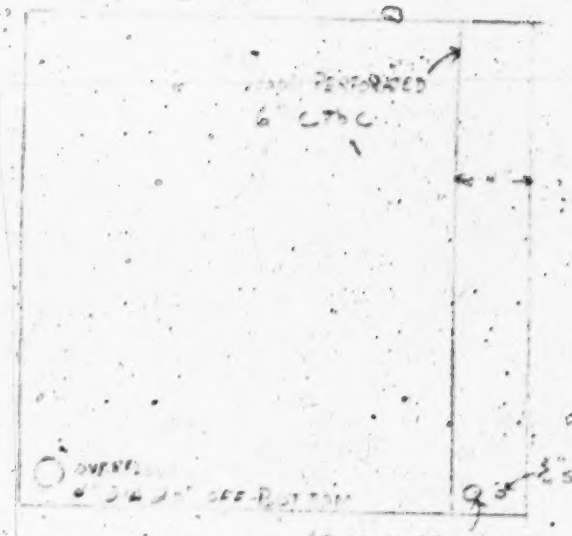
Tank #10



1. Wood tank, not lined lined.

2. Size: Length, 1200 mm.; width, 700 mm.; depth, 2060 mm.; capacity, 93 gallons.

3. Rolls: Three bottom and four top rolls of the same specifications as Tank .

4. Supply: 3/4" steam line as shown in sketch, blows through to tank behind perforated baffle. 1½" water line feeds same compartment.

5. 4" bell top overflow 30" from bottom of the tank leads to drain. Cleanout to drain also.

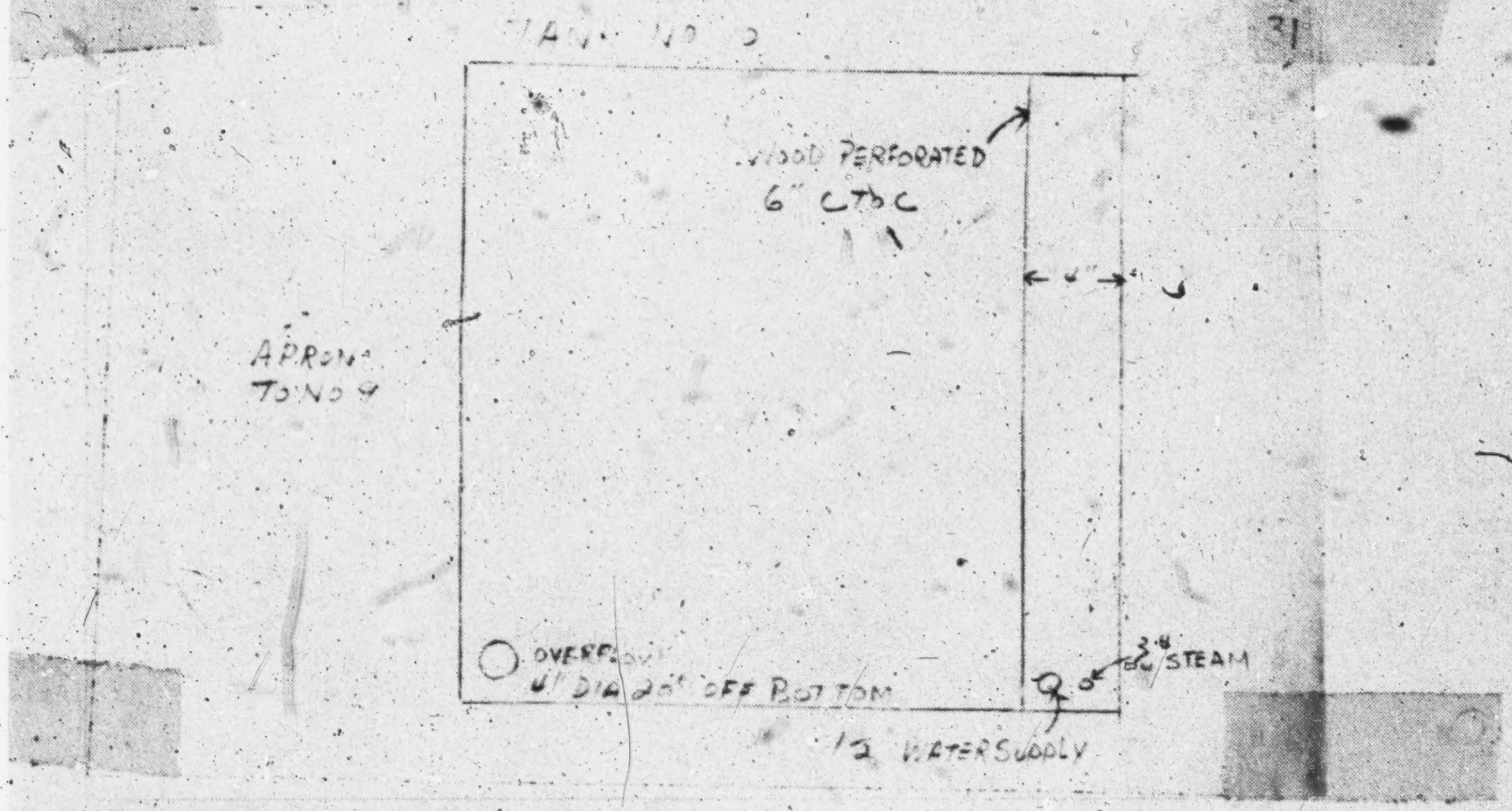
6. Covered by hood.

7. Lead apron between 10 and 11.

CASTING MACHINE

Tank #10

See sketch.



1. Wood tank, not lead lined.

2. Size: Length, 1200 mm.; width, 700 mm.; depth, 2060 mm.; capacity, 495 gallons.

3. Rolls: Three bottom and four top rolls of the same specifications as Tank 3.

Tank #11

1. Wood tank, lead lined.

2. Size: Length 2100 mm; depth 700 mm; width 2060 mm; capacity 798 gallons.

3. Rolls: Seven bottom rolls of steel tubing, cast-iron ends, rubber covered, acid resisting bronze journals and bearings. All exposed space inside of tank is covered with hard rubber. Eight top rolls are of same construction except that they have steel shafts and cast-iron bearings. The hard rubber covers all exposed surfaces.

4. Supply: 22^0 Beaume hydrochloric acid through $1\frac{1}{4}$" hard rubber pipe. Actually this is not done on #3 machine as the tank is supplied by bucket from a similar tank in #4 machine. This tank, however, has hard rubber pipe feed.

5. Overflow $2\frac{1}{2}$" straight top 21" from bottom and clean out flows to sewer.

6. Under no conditions place heating coils in this tank.

7. Tank covered by #3 hood. Fume conditions are exceedingly bad surrounding these tanks. The chlorine liberated when film carries over bleach solution rools over side of tank and forms a fog which is detrimental to good working conditions.

8. Hydrochloric acid will be fed to this tank so that the feed will

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Tank #11 (cont'd)

always be beneath the level of the liquid in the tank and a special exhaust system is being installed to take care of any fumes liberated that the exhaust hood does not take care of.

9. Standard squeeze rolls, soft rubber top, hard rubber bottom are now placed at the entrance and discharge of this tank.

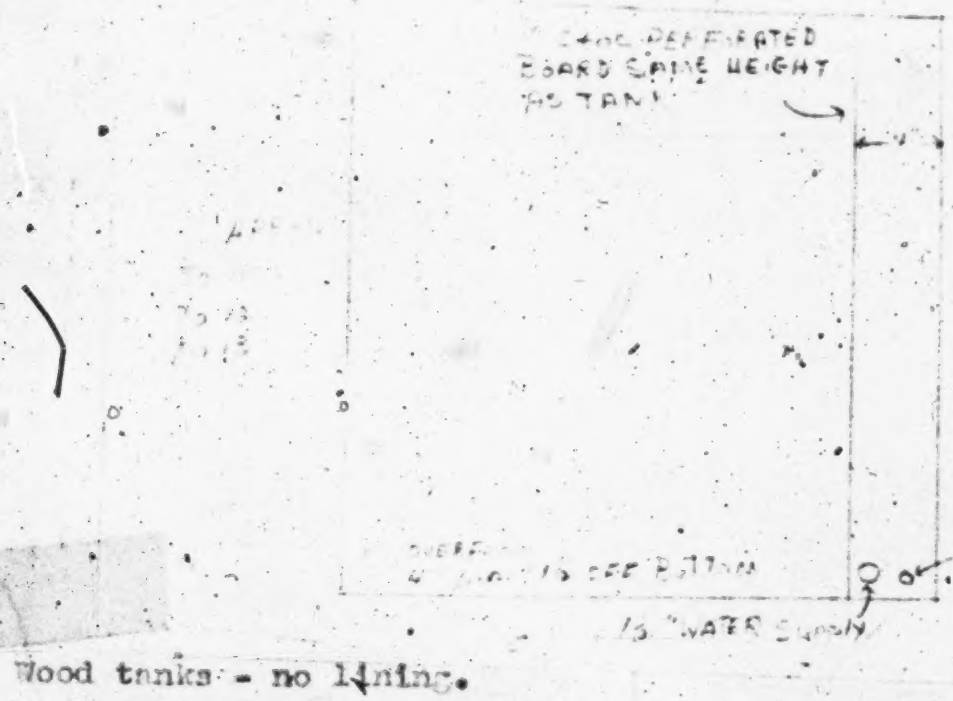
10. 1 1/4" hose and wash water from above between Tanks 11 and 12.

11. Lead lining is unsatisfactory for this tank as it is attacked by this acid. American experience proves it advisable to line this tank with rubber, and provisions are being made, after careful investigation, for so doing.

12. It would be advisable that the apron between Tanks 11 and 12 be of rubber covered iron, or of straight sheet rubber. Lead is used in France but is conceded as being unsatisfactory.

Tanks Nos. 12 and 13

...doe sketch.



1. Wood tanks - no lining.

2. Size: Length - 2100 mm; depth - 700 mm; width - 2060 mm; capacity - 738 gallons.

3. Rolls: Seven bottom and eight top - same construction as [illegible].

4. Supply: 1½" S.B. pipe for water, 3/4" S.B. pipe for steam. Mix behind perforated wooden baffle. Steam blows directly into tank - no steam coil.

5. 4" bell top overflow [illegible]" from bottom. Flow from it and clean-out goes to sewer.

6. No. 3 hood covers only #12 tank. No. 13 tank is open.

7. It has been found that the film traveling from hydrochloric tank #11 carries some of this acid through to the glycerine even if it is washed through tanks 12 and 13. The installation of tank 14 of the same makeup as 12 and 13 has been recommended for the American machine. By this it is expected that no acid will reach the glycerine bath. Standard black pipe is corroded in this bath so the use of lead is recommended.

8. Aprons between 12 and 13 and 13 and 14 are lead.

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MICRO CARD

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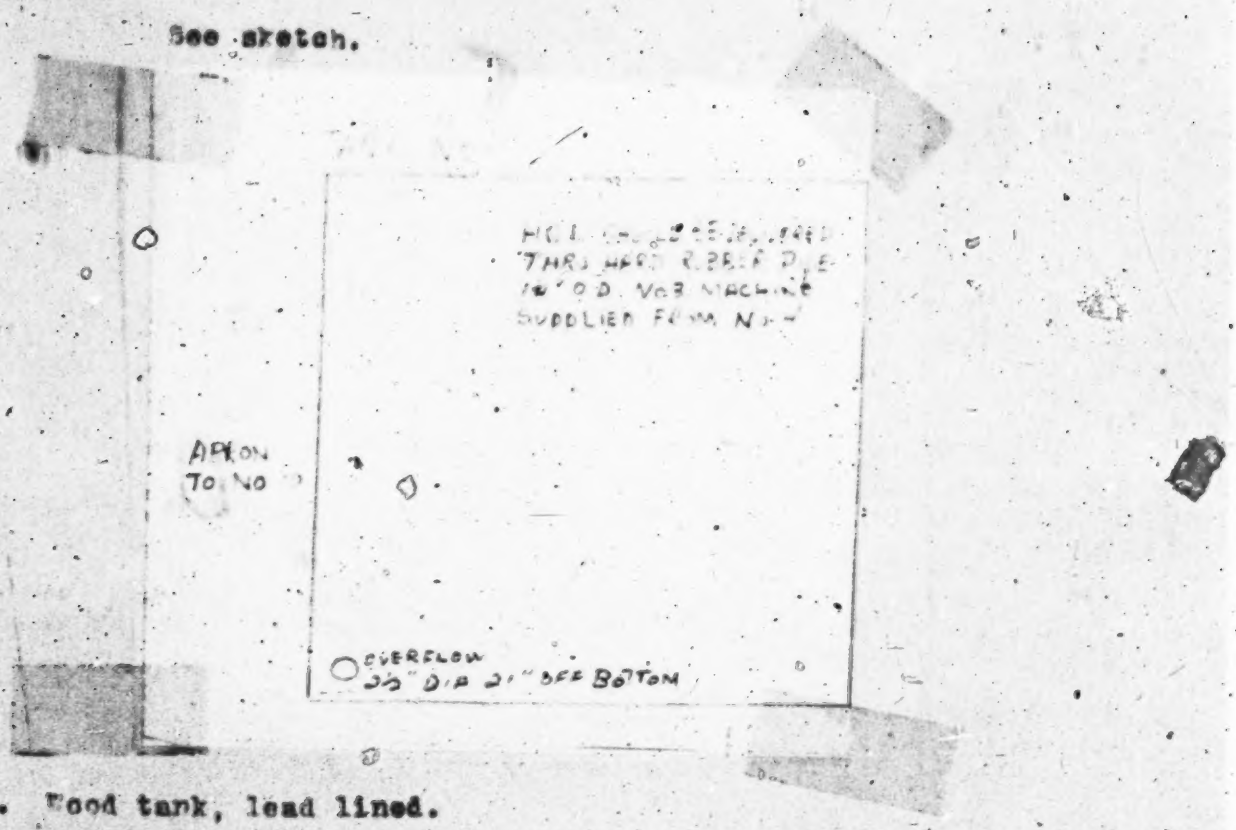
2. CASTING MACHINES

Tank 14

See sketch.



1. Wood tank, lead lined.

2. Size: Length: 1300 mm.: depth, 700 mm.: width, 2060 mm.: capacity, 496 gallons.

3. Rolls: 3 rolls bottom, 4 rolls top. Same construction as Tanks 12 and 13. Standard squeeze rolls at entrance to and exit from tank.

4. Supply: From a lead receiving box a 1" pipe passes to the center of the tank at the intake end for pure or reconcentrated glycerine as desired. The glycerine supply lines from the coagulating bath house are of iron and their discharge to receiving box is by sight drip. There is a separate feed line for both pure glycerine and reconcentrated.

5. 2" overflow 20" from bottom. Return flows to sump in coagulating bath house or to sewer; clean out plug does likewise.

6. No heating coils provided in France but, due to the cold water that might be supplied the American plant, a lead coil is advisable in the dryer end of the tank.

7. No hood.

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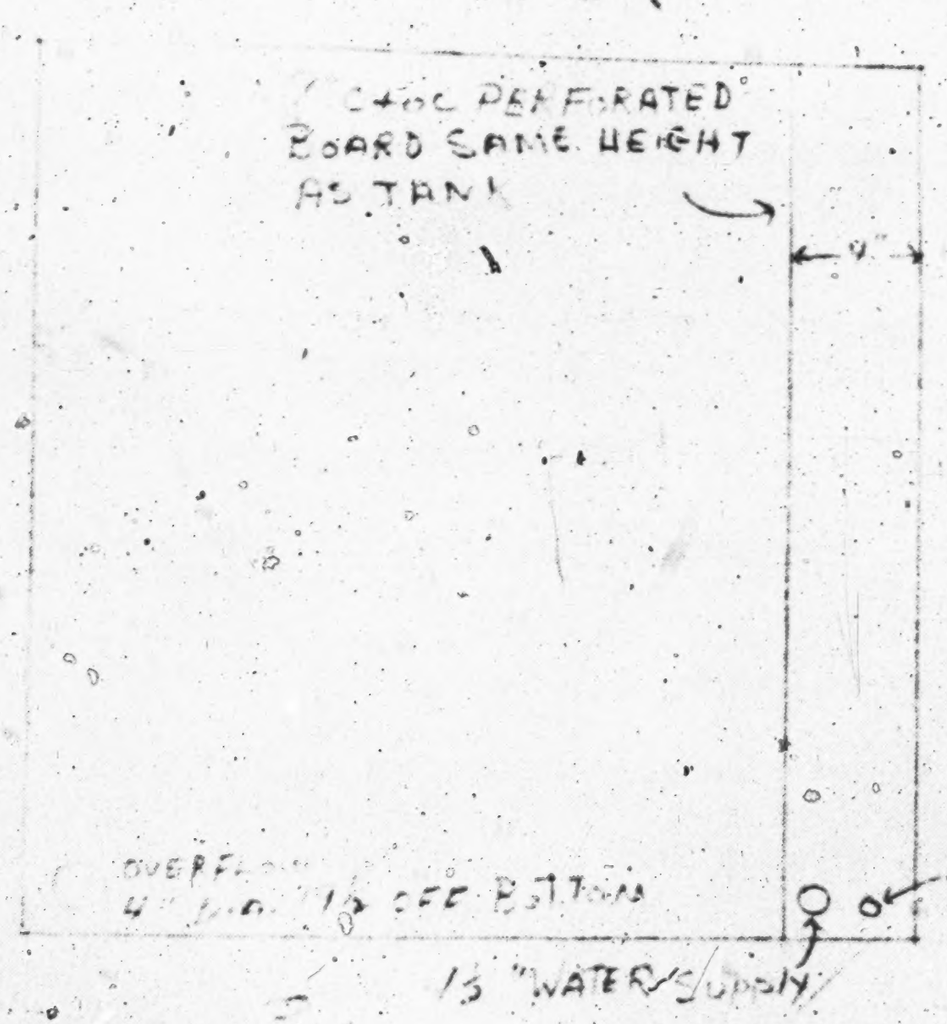
Tanks Nos. 12 and 13

See sketch.



1. Wood tanks - no lining.

2. Size: Length - 2100 mm; depth - 700 mm; width - 2060 mm; capacity - 738 gallons.

3. Rolls: Seven bottom and eight top - same construction as 10.

4. Supply: $1\frac{1}{2}$" S.B. pipe for water, 3/4" S.B. pipe for steam.

SUMMARY OF ROLLS:

Premier Roll 1
Total Bottom Rolls 85
Total Top Rolls 93
Total Idlers 12
Total Squeeze Rolls ...12

Of the bottom rolls, 55 are of cast iron ends, S. B. pipe covered with regulus metal, acid-resisting brass journals and bearings. Seven are of the same specifications, only covered with hard rubber; 21 are of cast iron with cold-rolled steel journals and cast iron bearings.

Of the top rolls, 61 are cast iron S. B. pipe, cast iron ends covered with regulus metal and have cold-rolled steel shafts running in cast-iron bearings; 8 are of the same specifications and are covered with hard rubber; 24 are plain iron tube rolls uncovered.

The 12 idlers are steel tubes, rubber-covered, cast iron ends cold-rolled steel journals and cast iron bearings; four of these are covered with regulus metal instead of rubber.

The 6 sets of squeeze rolls, or 12 rolls, are steel tube cast iron ends, cold-rolled steel shafts, iron bearings. The top roll is covered with soft rubber and the bottom rolls with hard rubber.

The premier roll is of acid-resisting bronze; all exposed parts in the bath being covered with regulus metd.

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CASTING MACHINE - ROLLS

The metal skeletons of all casting machine rolls are made in the machine shop at Bezons. Lead and antimony covering is applied there. Hard and soft rubber rolls are shipped to Paris and covered by rubber manufactuber. The small rubber rolls are not turned in a lathe before covering, but the larger ones are. None of the lead and antimony rolls are turned before covering. All rolls are turned after covering. From a mechanical standpoint it would be better to turn the rolls before covering so that a more perfectly balanced finished product would result.

Standard squeeze rolls should be placed between tanks 3 and 4, 8 and 9, 9 and 10, 11 and 12, 14 and 15, and 15 and the dryer, as they prevent one bath from being carried to another.

The diameter of the rolls used in each of the four French casting machines is different and the one designed for the American machine is the product of experience gained so far in the manufacture of cellophane. The American drawings give complete details of same.

The composition of the journals for the lower rolls is recommended by competent American metallurgists as -

Copper	82
Tin	10
Lead	2
Nickel	6

and the lower bearing boxes, bronze composition -

Copper	88
Tin	9
Lead	3

With possible 1/4 of 1% phosphor copper.

DuPont Standard for acid resisting bronze is:

Copper	85
Tin	5
Lead	5
Zinc	5

To increase traction of rolls to film, to cause film to flow straight on roll when inequalities in its width are present, to equalize built-up deposits on rolls, or to prevent rough edges from knife-cut breaking cellophane, a couple of layers of calico cloth are wound around the roll. This is not good practice. If roll is defective it should be replaced and if film is uneven it should be rectified at casting block. However, cloth is frequently used in France and in case of an emergency gives excellent results.

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The lead and antimony rolls when scarred are removed from the machine and the lead and antimony chipped from the pipe body with cold chisel. The body is thoroughly brushed and cleaned and is carried on small push truck to power house. It is placed in a special cast iron mould suitable for the casting of the lead and antimony in this particular roll, which, with [illegible], inside is placed in the dust leading flue gases from boiler furnaces to stack. Mould and roll are kept in this chamber until a temperature of molten lead, is reached. Then same is hoisted to outpour of lead pot which contains sufficient lead to cover roll in one pour. Pour is made with mould standing vertically so as not to pocket air, and after pouring mould is kept in vertical position until set takes place. Then, mould is unclamped and covered roll returned to lathe in machine shop for turning. It is necessary that the temperature of the mould and roll approximate the temperature of molten lead before pour is made or chill cracks will develop in surface of completed roll. There is no balancing machine used in France to test status of completed rolls.

CASTING MACHINE GEARS

Each main machine roll is driven by standard iron gear that is in turn driven by standard iron gears on main shaft from motor.

All driving operations are centered on one side of machine; the other side being left free for operation.

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ROLLS, GEARS & SPROCKETS:

Always keep twelve upper and twelve lower lead and antimony rolls in stock as spares. It is advisable to stock twelve main roll driving gears of each design and three each of the larger non-standard.

GREASING & PACKING:

Use soft grease in all grease cups; thin with a little oil; grease with mixture of heavy black oil and cup grease. Use graphite on all roll box assemblage. Boxes must be removed and unless graphite is thoroughly worked into joint, trouble is experienced in pulling box from frame orifice. Drive box of lower roll is packed with hemp saturated with lard. Operating side of same roll contains rubber gasket. This practice is universal throughout the wet end of the machine. Unions for viscose handling that otherwise would leak are packed either with a thin rubber packing or a strip of muslin.

LIFE AND CLEANING:

Wash all rolls in wet end of casting machine after desulphuring bath once a week. Apply a 10% HCl solution with rag and then wash with water. This removes from rolls any deposits from bath. Rub all rolls of casting machine down once a week with emery cloth as per sample. This is done Sunday morning in France by the two regular machine operators for the wet end of the machine. The bath tanks of the casting machine are washed Sunday morning also by the foreman and regular wet end of casting machine force.

The life of a machine lead and antimony roll depends on the care with which it is handled. A deep knife cut might cause a roll to be taken out of operation at any time. Care must be taken that the machine operators do not keep their knives too sharp as the rolls are quite easily cut and a rough edge will cut the cellophane.

The average life of a lead and antimony roll without recovering is two months to one year. A hard rubber roll's life is about one year.

WORK AT CAST:

All casting machine fume stacks are made of 7/8 T.& G. skirting lumber. Three exhaust fans are of iron and have a capacity of 3 cubic meters a second each. This capacity is insufficient. These must be cleaned once a month or oftener, as sulphur deposits from fumes. It is advisable to paint woodwork with a coal tar paint, trade name Carbolyne, every 2 months or oftener.

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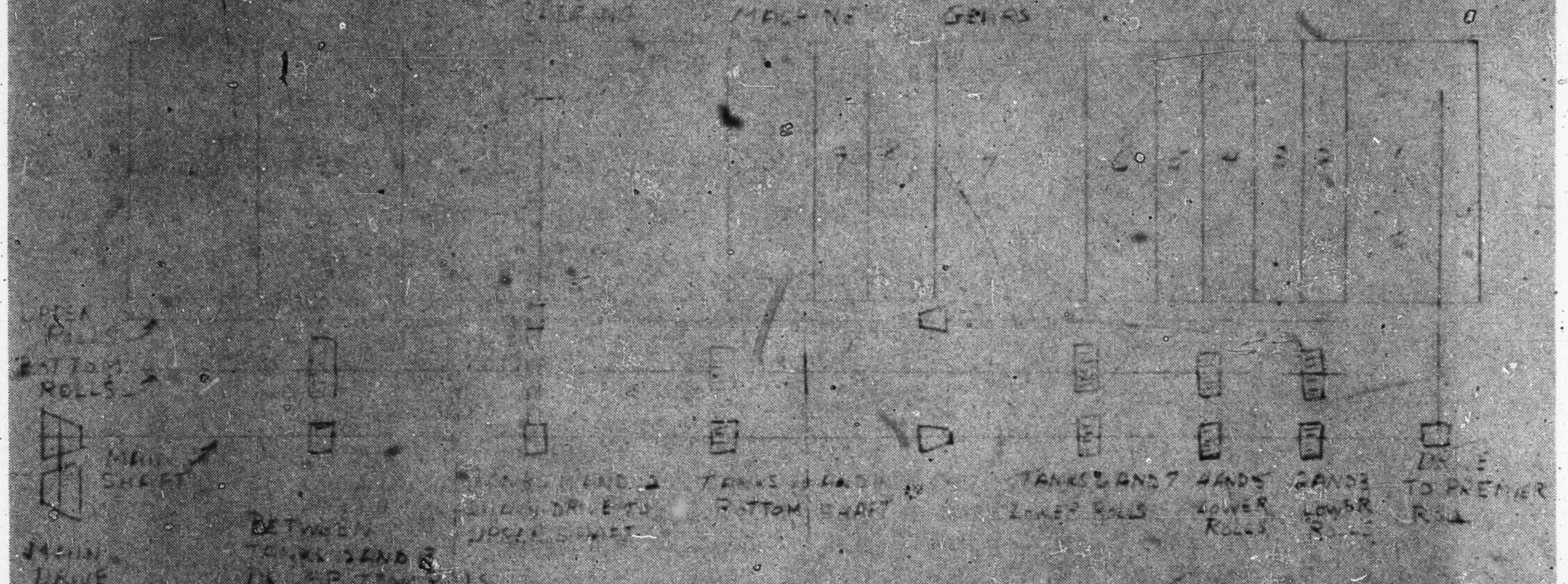
CASTING MACHINE GEARS

Each main machine roll is driven by standard iron gear that is in turn driven by standard iron gears on main shaft from motor.



All driving operations are centered on one side of machine; the other side being left free for operations.

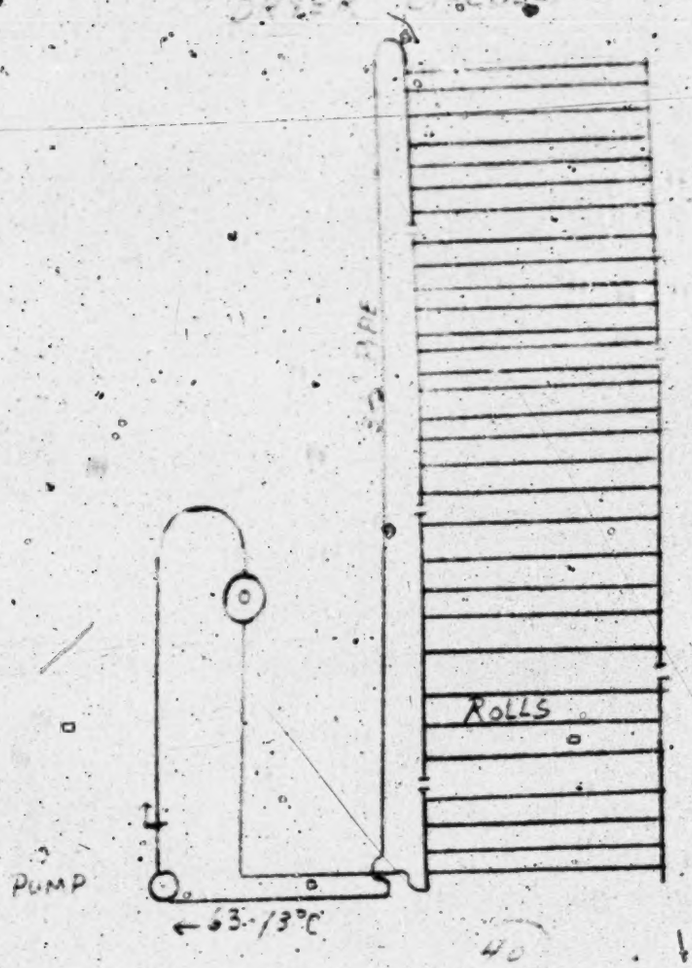
CASTING MACHINE - DRYER END

See photograph

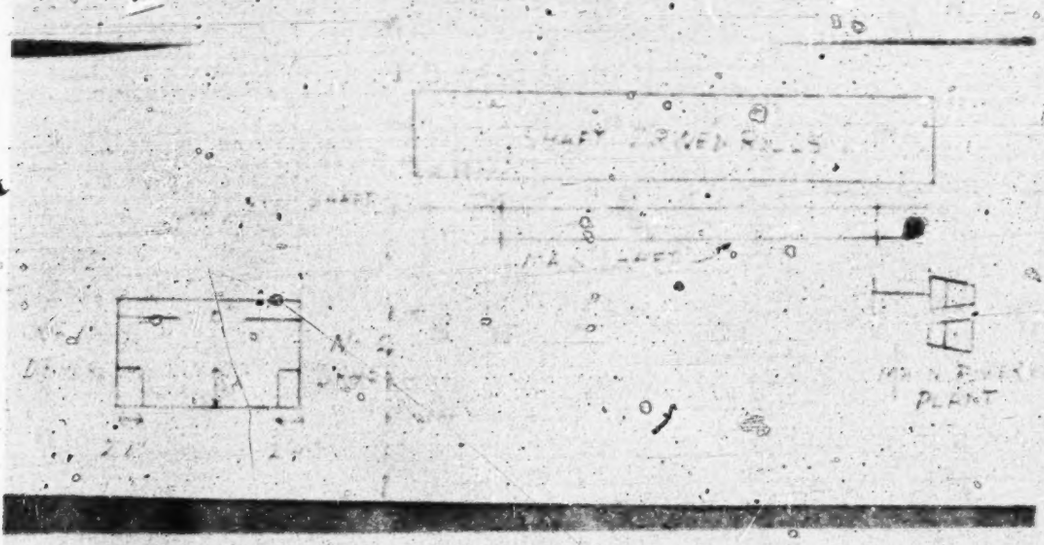
The casting machine dryer is an adaption of the dryer frequently used in paper manufacture. It contains 58 bottom rolls and 55 top rolls. The first 19 top and bottom rolls at the entrance of the dryer are larger than the remainder, this being necessary as the film, if uneven, tends to crawl when it strikes the hot surface of the rolls. Present dryers in France have but 14 top and bottom and this extra length and the film at times crawls to a such an extent that the top short roll pipes [illegible] the film and injures it. For this reason, 19 rolls are specified of greater width for the American machine. All top rolls should be covered with hard rubber and all bottom rolls [illegible] lead and [illegible] antimony. Experiments have been made in France with aluminum cylinders, cast iron ends, copper, zinc covered, and nickel plated rolls, but the best results have been obtained from hard rubber and regalus metal. It would be better if a covering having the acid resisting qualities of lead and antimony but being not so easily scarred by knife, were developed. When semi-dry cellophane breaks and winds around either top or bottom roll it must be thrown from the dryer as quickly as possible in order that the continuity of the flowing film be kept. Operator cuts cellophane from roll with knife and unless these knives are carefully watched and operators carefully schooled, serious damage can be done to either the hard rubber or the lead and antimony rolls very quickly.

DRYER ROLLS

The bottom rolls of the dryer are hollow and are fed with circulating hot water through the drive side of the dryer; return of this hot water leaving through bearing on operating side. These rolls run in iron bearings supported on steel framework and are driven by belt from shaft along floor. Belt drive is essential to allow slippage. A positive drive would cause constant rupture of film. Top rolls have a narrow flange on either end which travels on the circumference of the bottom rolls. This gives necessary drive for top rolls. Bottom roll must have vent pipe inserted in it that air will not be pocketed and the roll always filled with hot water. The last five rolls of the dryer before the winding stand should not be heated, as cellophane reeled warm retains its heat for hours, is more apt to be brittle and cuts with much greater waste. The life of a dryer roll is the same as the same class roll in a casting machine. Read paragraph page 39.


ROLLS
PUMP
← 63-73°C

Dryer rolls are driven as per sketch and are heated by a self-contained circulating hot water system. See sketch



DRYER ROLLS-WATER HEATING

In addition to heating by hot water an indirect fan system top and bottom is allowed for. Air is circulated by two fans for the top duct and two for the bottom, capacity 14 to 15 cubic meters per second. Temperature of air at inlet end for film should never be more than 90° Cent. and at the dry or outlet end for film 60° Cent. The temperature of air at dryend of dryer should never exceed 90° Cent. and it is best to set 80° as a maximum. The best film is produced when its temperature is never more than 60° Cent. and the speed of the dryer about 25 meters per minute. It is the opinion of Mr. Brandenberger that the ventilating fans are not necessary; Hot water alone is sufficient. He is designing machines now for installation at Bezons and the ventilating ducts will be left off. The drying rolls will be open and will be lowered nearer to the floor so that the film on them might be handled readily without danger to the man. Water is heated in a tank by steam coils and is circulated to each machine by its own centrifugal pump.

DRYER HEATING- AIR

The quantity of air delivered to the wetend of the dryer for a casting machine is 5 cubic meters per second and its velocity approximately 10 meters per second. The temperature of the air supplying dryer is maintained by steam pipe coils extending the

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length fo the top and bottom ducts. Air distributing nozzles are of special design and a blueprint of them has been given [illegible]. Amount of water evaporated per 3000 pounds of film dried is from 3000 to 4000 pounds.

DRYER HEATING- WATER

The temperature of the water supplied at the wet end of the dryer to the bottom rolls runs from 60° to 70° Cent. for good operation. We have seen this supplied as high as 90° Cent. for three hours and run from 77 to 87 for several days. The film was from viscose of index 2-1/2 and ran perfectly without breaks. Ventilating fans were cut off and all sides of dryer open. The film when placed directly under a cutting knife before it had been sufficiently aged, gave a ragged cut.

DRYER- FAN DRIVE

The dryer and casting machines are both driven by one motor. 40 kilowatts per hour are required for this work. The four ventilating fans for the dryer require a total of about 15 H.P. Clean these once a month as sulphur is deposited in them and must be thoroughly removed. During the winter months these fans are sometimes used. The casting machine dryer has moist air fan capacity of 2 cubic meters per second that former carried moisture from first ten dryer rolls to atmosphere. This has been removed now and the moisture from the film when the ventilating fans are not in motion, passes directly to the room.

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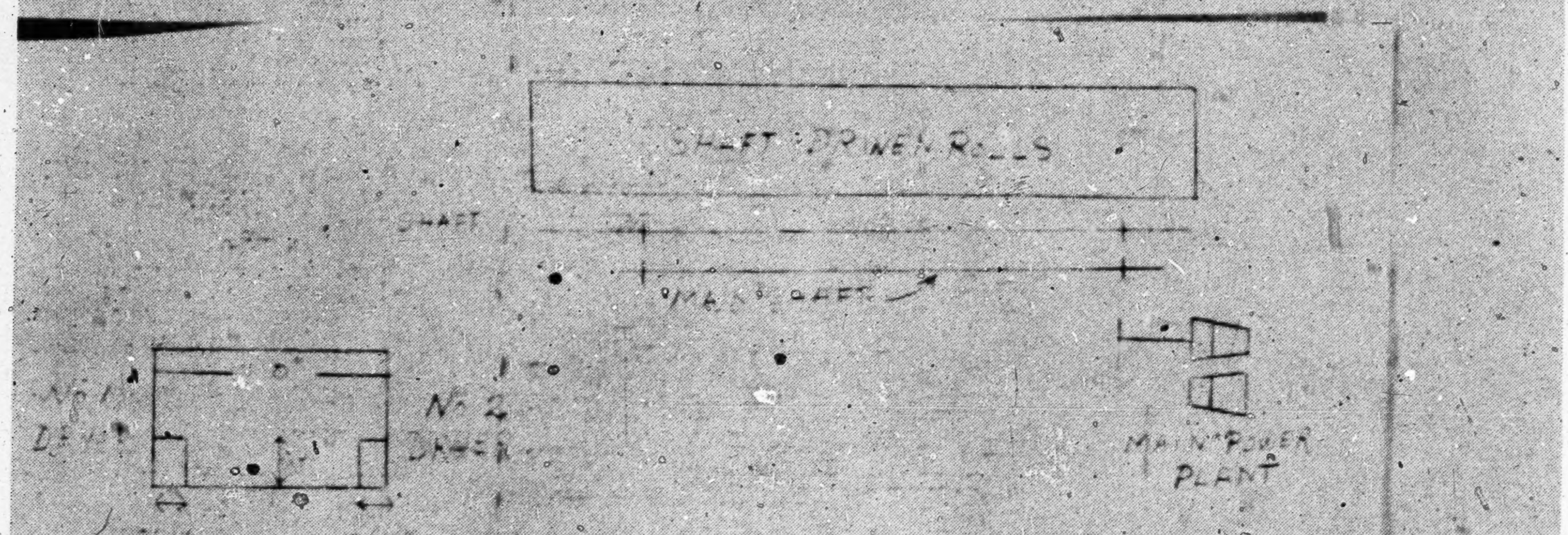
343342 O - 55 - vol 8 - 45

Dryer rolls are driven as per sketch and are heated by a self-contained circulating hot water system. See sketch



DRYER ROLLS-WATER HEATING

In addition to heating by hot water an indirect fan system top and bottom is allowed for. Air is circulated by two fans for the top duct and two for the bottom, capacity 14 to 15 cubic meters per second. Temperature of air at inlet end for film should never be more than 90° Cent. and at the dry or outlet end for film 60° Cent. The temperature of air at dryend of dryer should never exceed 900 Cent.

CASTING MACHINE - PIPE LINES:

	Feed	Return Waste	
Water	3 B Pipe	Hose- Lead	) Standard Valves used
HCl	Hard Rubber	Hose Hard Rubber	) on H_2O & Steam
H_2SO_4	Lead	Lead Lead	) Iron plug cocks used
Ammonium Sulphate	Lead	Lead Lead	) on all caustic and
Bath			) Viscose solutions
Desulphuring	3 B Pipe	Hose 3 B Pipe	) No bath solutions are
Wirsch	Lead	Lead Lead	) controlled by valves
Glycerine	3 B Pipe	Lead Lead	) other than rubber
			) hose controlled by
			) Iron plugs.

CASTING MACHINE & CASTING BUILDING -
AIR LINES:

Viscose mixers and cooling & Blending Tanks 2½-3 kg/sq. cm. = 42⁵⁷ / sq.in.

Water and Caustic Measuring Tanks 0 - 500 g/sq.cm. = 7# sq. in.

Viscose Opening Tanks and Caustic Wash Tanks 2½-3 kg/sq.cm. = 42⁵⁷ #/sq.in.

Baratties - 300 g/sq.cm. = 4# sq. in.

Air supplied by two belt-driven, 10" x 10" Ingersoll-Rand single stage Compressors both operating and supplying three receiving tanks of about 470 cm. sq. x 335 Cm. These tanks are kept under pressure of 3⁵ 4 kg sq. cm. and feed all air lines. Reducers are used where less pressure is required. One 2½" pipe supplies Chemical Building; one 2" pipe to Viscose Opening Room and one 2" pipe to Manometer box at head of Casting Machine for the control of the feed tanks. Air supply is just about adequate for plant requirements. Compressors are in operation steadily when plant operated.

CASTING MACHINE - CASTING BLOCK CONSTRUCTION
OPERATION AND MAINTENANCE:

See photograph.

Details of Casting Blocks were forwarded by Bemis on a Blue Print to U. K. Howe for use on American machines. Bezons is also making up three (3) Casting Blocks for use on the first two American Casting Machines. The body of the casting block is cast-iron, this being hung on hollow cast-iron trunions through which Viscose is fed to block, that only the lips of the block are submerged in either coagulating bath. It is detrimental to allow iron to become immersed in either bath and for this reason the lips are made of a nickel alloy. Two alloys have been tried; the first being used now is the better.

	(Nickel	- 97.97		(99.25
	(Cu	- 0.08		(0.12
(1)	(Zn	- 1.52	(2)	(0.25
	(Fe	- 0.35 (Hold Low)		(0.32
	(Si	- 0.06		(0.01
		.02 Variables		

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2 is not really satisfactory. It resists both action but has no elasticity and is readily distorted. An inexperienced operator can readily cause a hopper to be sent back for reset, by distorting the lips too much in any one spot.
It is essential that jaws be opened and closed uniformly. Two men should do this, each operating two control wheels a quarter turn at one time together, then the 5th wheel a quarter turn, then repeat in end wheels.
Control wheels of hopper jaws are bronze as well as toggle links. The last toggle link and pin that touches bath should be made of nickel alloy above. Control wheel screw V thread is 2.5 mm pitch and 22 mm diameter. Back control screws are nickel and have 1 mm pitch V thread 14 mm diameter.
Each casting hopper should be thoroughly cleaned with 6-10% NaOH before being used; the caustic entering through trunions and discharging through lips. If hopper is in place and has had viscose in it and then requires cleaning, return bath to coagulating bath house, open drain, and then pass caustic through viscose line from Viscose Opening Room, through filters and trunions into casting block. Allow flow to continue until it is clear of any viscose stain. Then air is blown through hopper and outside as well as filters are thoroughly cleaned with scrub brush and water. Then bath tank is washed with water, viscose is pumped back in casting block and machine started up again. If block trouble still continues, such as bad odour, stripes etc., a new hopper is used.

Hoppers are changed when needed as determined by [illegible] of machine. May be changed immediately or last as long as 3 months. Usually performed in Harrop runs from 4 days to 3 months. Always keep a hopper as spare, that is [illegible] for 3 machines.
Hopper weighs 4-500 kg and is handled by overhead chain hoist to wooden cart by which it is pulled to machine shop for repair.
If a hopper is defective it must be replaced and is cleaned as above described on the machine. It requires 2-3 hours to clean one, take it off machine and replace with a new one that is actually operating.

Lips of hopper not in place in machine are protected when not being worked on by white pine wood. Lip pieces are expensive and must be carefully guarded against any injury.

The trueing up of the lips of a hopper as well as the nickel alloy blocks at the ends of the jaws, is done as follows:

Carefulness and thoroughness are the essentials of the man who does the work. At Besons one man is kept steadily engaged, one shift, in keeping lips of casting blocks for four machines in operating condition.

The block on arrival at repair bench is carefully lifted by trunions and placed on bench so located that good working light is obtainable, with lips up. Mechanic first takes off nickel alloy end blocks and dresses these as follows. Dress with a fine flat file, blocks being held rigidly in a flat position. Then dress with 0 India Stone, using kerosene as dressing medium.

If jaws are badly distorted they are removed from the block and clamped snugly in place on work bench. A perfect horizontal edge marked with red ochre is moved along edge of lip. Low spots in lip will not be marked by the red ochre. High spots are

4-4

dressed down roughly with a triangular file that has been dressed to give three sharp cutting edges. This removes the worst irregularities and the remainder are taken care of by placing a No.0 combination stone in a wooden block and moving it endwise along this lip. Kerosene is used as dressing medium. When both lips are true to the exact straight edge they are placed back on block and closed by control wheels. A electric light 100 watt is then held under the casting jack and the lips watched to see if the light can be seen through their fit. A perfect fit will show no light. End blocks are fitted to jaws in like manner and if O.K. guard is placed over lips and hopper is ready for reuse.

Require two men 15 days to place a set of distorted jaws in perfect condition.

No.0 India stone combination called is made by the Norton Company, Worcester, Mass., U.S.A. - Address Pike Mfg. Co., Pike, N.H., U.S.A.

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C A S T I N G M A C H I N E

OPERATION and PRODUCTION

CASTING MACHINE -- OPERATION and PRODUCTION

Film cast in H_2SO_4-Na_2SO_4 bath leaves coagulating bath a light yellow with green overcast color. In tank 2 it becomes white - yellow-white, slightly green. Tanks 3, 4 and 5 reduce the greenish cast to the film and it becomes a white opaque. Tank 6 changes film to a brilliant yellow, transparent. Nos. 7 and 8 tanks decrease the yellow and the film in bleach tank #9 becomes clear transparent.

If HCl wash tank #10 is kept warm, the film becomes a bluish transparent, due to hot water swelling same. This frequently carries to dryer when heat throws off moisture and makes film transparent.

Should the film when dried have a smoky appearance or a spotted look, it is due to insufficient washing and Na_2SO_4 has been deposited on it. 3 wash tanks before the glycerin tank might give sufficient washing but Mr. Brandenberger is considering 4 for the machines he is designing at Bezons.

Film cast in ammonium sulphate bath is a soft green-yellow brown gelatinous mass. It remains this color through tank 2 when it is converted. The last half of tank 2 and tank 3 the color is a yellowish marble opaque. Tanks 4 and 5 make slightly more opaque. Tank 6 makes it yellow transparent and from 8 on the changes in color are like H_2SO_4-Na_2SO_4 bath.

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CASTING MACHINE

PRODUCTION FROM MACHINES NOS. 3 & 4
N_2 SO_4

MACHINE NO. 3 - SEPT. 18, 1923.

	Hours 6-14	Hours 14-22	Hours 22-6	Total
Quality #253 White	12425 M	13300 M	11650 M	37375 M
Weight	311.0 Kg	331.0 Kg	291.5 Kg	933.5 Kg

MACHINE NO. 4 - SEPT. 18, 1923.

Quality #253 White	10700	13050	11000	34750 M
Weight	320.5	317.5	275.0	913.0 Kg

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CASTING MACHINE PRODUCTION

February 1923

Date	Sulfate Machine No. 1, Total Kgs.	Sulfate Machine No. 2 Kgs.	Acid Mach. #4 (Same sizeas all .02 mm thick (new Mch. #3 Kgs.	
1	527.5	597.5	915	All .02 thick except on #2 This is 10 to 20% .04. Glyc. 16 to 17% on machine #4.
2	549.5	504.0	819	
3	113 shut-down	599	900	
5	600.5	512.5	722	
6	456	595.5	970.5	
7	531.5	652	873.5	
8	588.5	579	915.5	
9	517.5	652	798.5	
10	450	518.5	741.5	
12 Monday	240.5	445.5	824	
13	374.5	505.5	902	
14	515.5	560.5	972	
15	506		918	
16	507	Repairs and change over to K.P. film	868	
17 Down Noon	113.5		755	
19 P.M. 2	910.5	45% glyc. 350.5 Thick .05	760	
20 "	1144	Dens. 1.080 646 17-18% Gly	851	
21 Gutta Percha	1060	40% glyc. 604.3	860.5	
22 "	1230.5	Dens. 1.06 646 at 20° C.	913.5	
23	513.5	628	715.0	Two hr. shut-down
24 Sat.	387	52.5	835.0	

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LOG AT END OF NO. 3 MACHINE

Sept. 17, 1923.

23000 Meters per 24 Hours

11 - 1000 Meter Rolls Produced 9/17

Previous to this Record -

Cm Width	Meter Length	Kg. Weight
95	1000	25.500 Kg.
95	"	25.000
96	"	25.000
97	"	25.000
96	"	25.000
96	"	26.500
95	"	25.500
95	"	25.000
95	"	26.500
95	"	25.000
94	"	23.500
93	"	32.000

Sept. 18, 1923.

96	"	23.000
95	"	23.000
92	"	23.500
92	"	24.000
92	"	26.500

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2. CASTING MACHINE

VISCOSE CONSUMPTION

The average consumption per 24 hrs of each of the 4 French machines is as follows:

#1 - $(NH_4)_2SO_4$ - NA_2SO_4 Bath	-	6	Viscose	Mixer	Charges
#2 - " " "		6	"	"	"
#3 - H_2SO_4 - "		10-12	"	"	"
#4 - " " "		10-12	"	"	"

= 15-16# Viscose from Viscose Ripening Room
= 1# Cellophane at dry end of casting machine Dryer

or 100 kg. Viscose at casting block = 6-6.5 kg. Cellophane at end of casting machine Dryer.

= 8# Cellophane film entering glycerine bath of a casting machine =
1# Cellophane at dry end of casting machine Dryer.

= 100 kg. paper as received at steeping press equals - 80 kg. Cellophane at end of Dryer.

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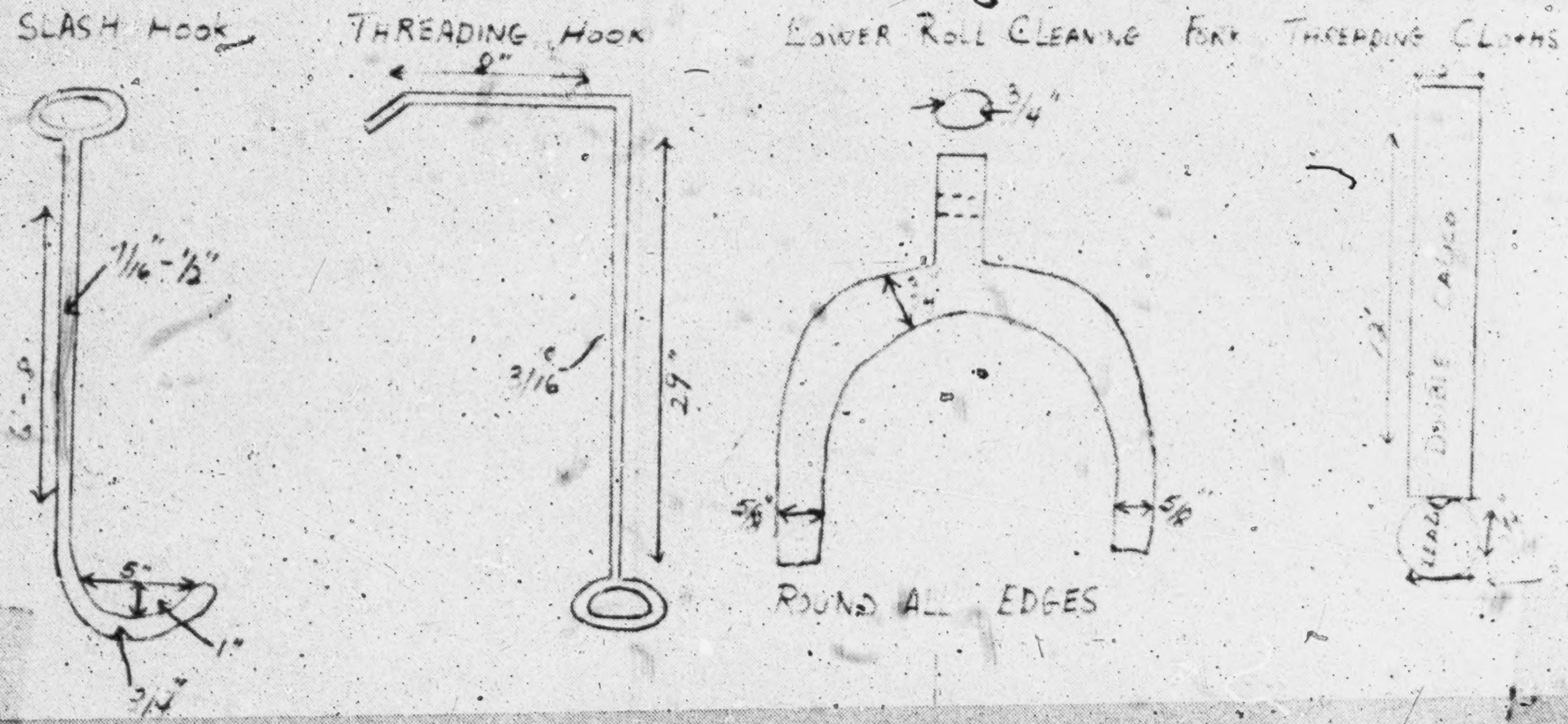
P. CASTING MACHINE

FILM SHRINKAGE

Very little definite data has been recorded at Bezons on progress of film shrinkage. General information is available; for instance, a ripe viscose 0 to 1 index shrinks more than an unripe one 1 - 3-1/2 index. The film on leaving the dryer varies in width from 80 to 98 centimeters. Shrinkage of film is controlled by varying temperature of different casting machine baths and a film width at the end of dryer of 90 to 100 is considered satisfactory. A general statement of what shrinkage takes place in the various baths for 6.5% cellulose in viscose is given herewith.

Tank	Out of	Entering Width		Leaving Width	
	Hopper	180 cm	70.86"	180 cm	70.86"
1	Coag. bath acid or alkali	180	70.86	---	
2	1st H_2SO_4 wash	150	59.06	130-140	51.18-55.12
28	2nd H_2SO_4 wash	140	55.12	125-130	49.21 51.18
4	Water	130	51.18	130	51.18
6	Desulphuring	115-120			
		45.28	46.46	110	43.31
9	Bleach	110	43.31	110	43.31
14	Glycerine	110	43.31		
	Outlet end of dryer	90-100			
		35.43	39.37		

10. 1 Stone Fork
11. 1 Wheelbarrow (all wood) for two Casting Machines
12. 2 Brooms for general cleaning (2 Machines)
13. 2 Scrub brushes screwed to a 4 ft. stick - For cleaning rubber roll in each casting machine.
14. 2 Soft wire brushes 2½ x 8" or 10" for cleaning regulus metal rolls of each casting machine, screwed to a 4 ft. stick.
15. Necessary wrenches for opening unions and dogs in filters.
16. One-piece overalls, beltless and no loose ends for dryer operators.



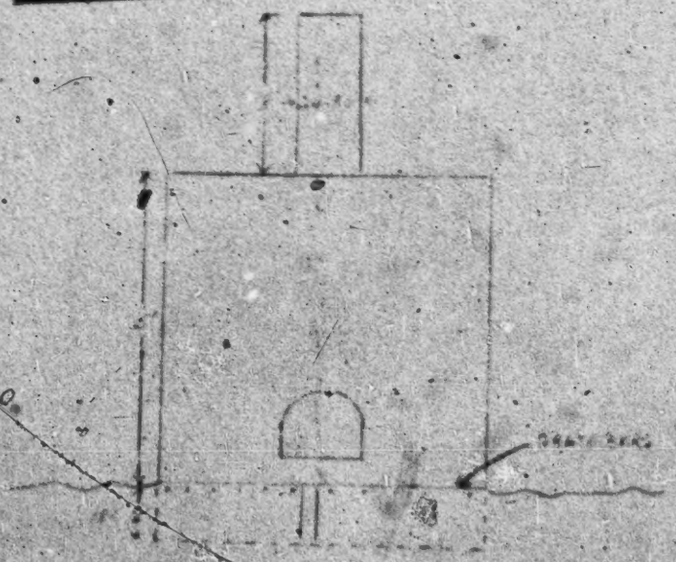
17. 2 Pair rubber shoulder gloves for each casting machine.
18. Rubber gloves for wet end of machine operators.

CASTING MACHINE

WASTE FILM:

No accurate records are kept at Besons from which the waste of viscose at the casting machine can be definitely ascertained. An estimate is that 10% of the viscose supplied the casting block is lost through breakage of film before the dried film is wound at the end of the casting machine dryer. Unfinished film from the wet end of two casting machines is thrown in the aisle on the operating side of the machine and is here collected with a stone fork in an all wood wheelbarrow by a clean-up man. It is spread on the ground to dry before a brick incinerator. It is not weighed. (See sketch)

SKETCH 3 x 3



One man, one eight hour shift and one incinerator is required for two casting machines. Two incinerators are installed in France for the four casting machines. During damp weather smoke from the incinerator is objectionable because of its odor, although no complaint of moment has been registered.

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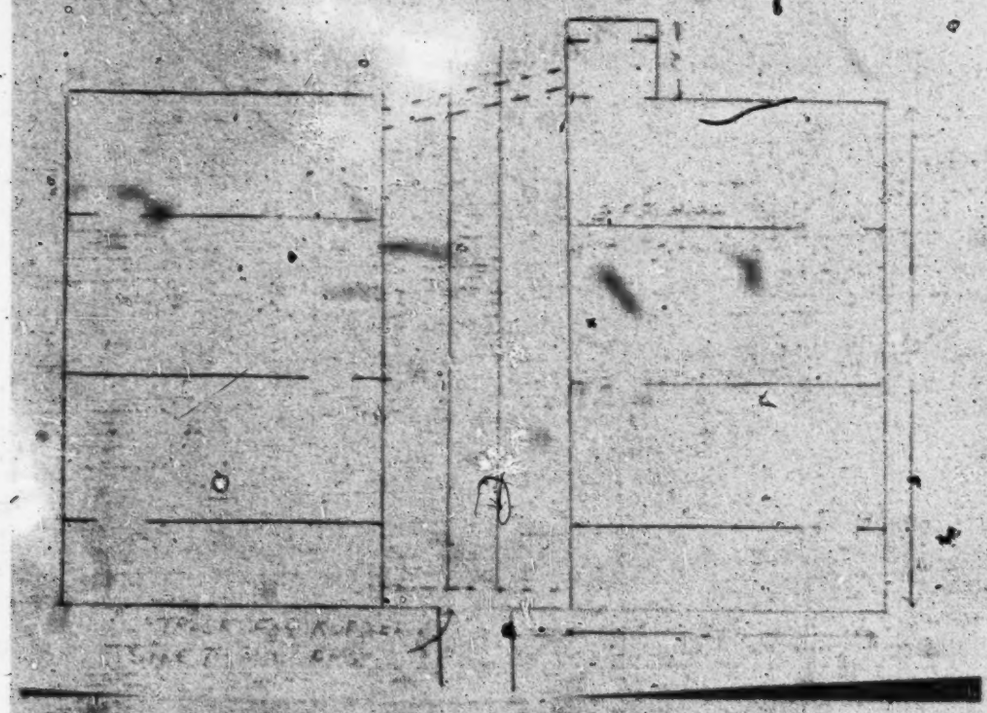
CASTING MACHINE

WASTE WATER

The water waste from the four casting machines as well as the other operations of La Cellophane plant, passes through one of two concrete settling basins (see sketch)

SKETCH 4 x 4



Pieces of film, iron oxide, filter wash, rags, etc., are settled out during the water passage. When one basin has served its purpose it is cut off and the water flow passed to the other, while the refuse that has settled in the first tank is loaded on a side dump Koppel car and is hauled to a waste dump. The acidity of the discharge has caused a slight disintegration of the concrete below floor level. Were this protected by an acid resisting paint there would probably be no disintegration.

CASTING MACHINE

DRYER WASTE

During the course of film through casting

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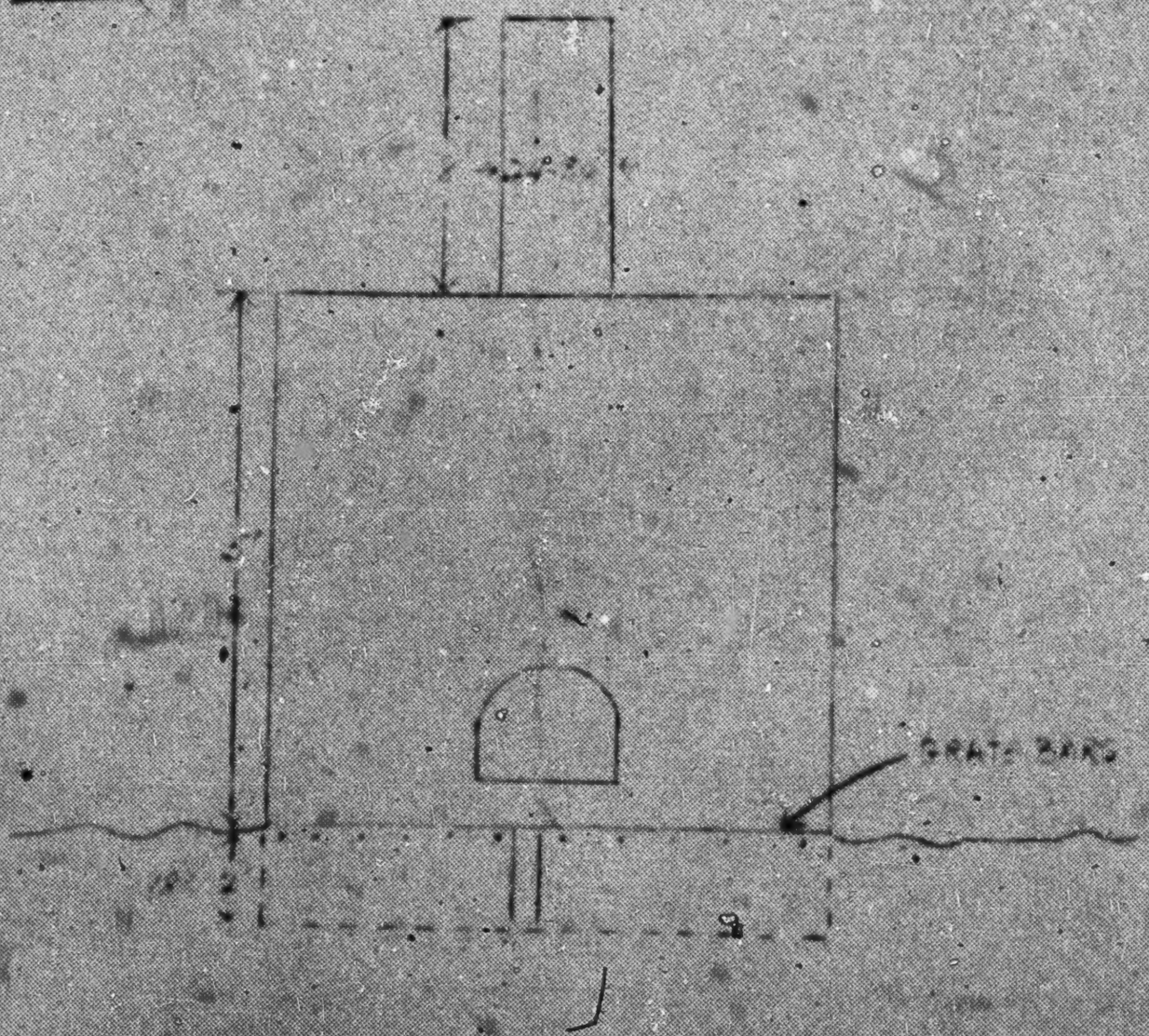
two casting machines is thrown in the aisle on the operating side of the mac ine and is here collected with a stone fork in an all wood wheelbarrow by a clean-up man. It is spread on the ground to dry before a brick incinerator. It is not weighed. (See sketch)

SKETCH 3 x 3



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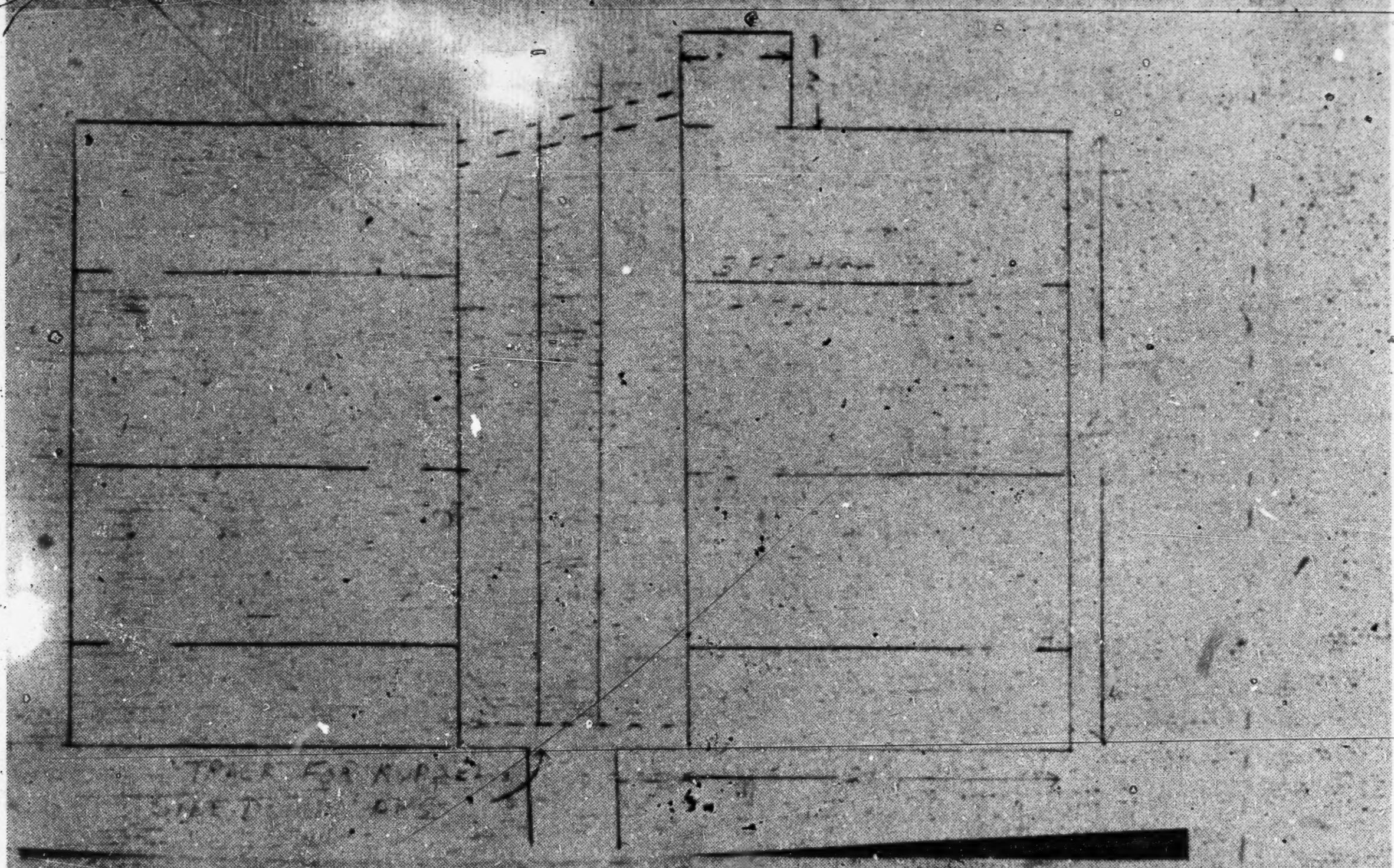

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machine dryer breakages occur and before the continuity of flow is re-established considerable quantities of perfectly good film are thrown into the working aisle. In France this is bundled promiscuously and is passed to a flattening room. About twenty kilograms per dryer per 24 hours is so handled. Similar strips are less frequently obtained from the dryers of the dyeing machines. No definite waste quantity was obtainable. This travels to the same flattening room. One forelady and ten girls working eight hours here smooth out, sort and place in suitable size packages for cutting between sixty and seventy kilograms of film per day. Five tables - per sketch -

are used. Colors are kept together and pieces sorted having in mind the greatest economy in cutting. All film is weighed when received and when passed to cutting room. Girls are paid piece work. Most of the cutting from this room is badly crinkled due to it having been bundled and the material cut from it is used principally for making tops for date boxes and other uses where second class crumpled film can be used. Pieces of film that come to this room and are too small to be passed to the cutting machine are bundled separately and are passed to a waste cutter where the material is shredded and used for the packing of high-grade china, individual bon-bons and confections where a show is desired.

CASTING MACHINE FILM - Size and Weight:

Sales No.	Thickness in mm.	Weight in kgms. per sq. meter.
253	.02	25 - 30
500	.03	40
700	.05	70
1500	.08	120
1800	.10	140
2000	.12	170

CASTING MACHINE — FORCE — DIRECT OPERATORS

For two Casting Machines / 24 hrs.

French Rates francs /hr.	
	1 Supervisor (Salary)
3 3/4-4	2 Foremen 1 for each machine these men work:
3-3 1/8	1 Manometer man for two machines
2[3]-3- 3 1/8	2 Casting block operators, 1 for each machine
[illegible]	4 Machine operators, 2 for each machine Dryer.
3 1/4-3[5]	1 Dryer Foreman (covers two machines)
2[3]-3-3 1/8	4 Dryer operators, 2 for each machine
2[3]-3	1 Cleanup man (covers two machines)
2[3]-3 e	1 Trash burner or incinerator man burns waste from wet end of two machines. This man works one shift only and is not always engaged here.
	14 Men per shift-42 men per 24 hrs
	1 Trash burner 8 hrs.

43 Payroll - 1 Supervisor (Salary)

To this add 4 operators/24 hrs.-see Coagulating bath house Force- Mechanics required, one shift with rates f/hr
1 Mechanic 1 shift keeps Hopper lips true - rates 3'-3[2]
Part time work is demanded of the following mechanics Carpenters 3 1/4, carpenters helpers 2 1/4-2[60], plumbers 2 1/2-3, plumbers helpers 2 1/4-2[60], pipe fitters 3 1/4-3 1/2, and helpers 2 1/4-2[60], electrician 2[60]-3, and helpers 2 1/4-2[60].
Counting laborers used in covering regulus metal rolls 3 mechanics and 3 helpers are necessary, 1 shift to keep 2 casting machines in operation.
Machine shop in France runs but one shift. If trouble happens to the casting machine at night, the night foreman calls foreman of machine shop as he lives close to the plant.
Casting machine is oiled by two oilers who oil by schedule all machines, shafting etc., in Cellophane plant.

Miscellaneous operating tools per machine.

1. 2 Lower roll cleaning fork See sketch
2. 2 Slash Hooks " "
3. 8 Threading Hooks " "
4. 6 Knives - 1 for each operator (Dryer and wet end)
5. 6 Threading Cloths, 2" x 12'0" See sketch
6. 1 Whistle - Foreman of each machine
7. Starting cloth buy by roll and cut as needed
8. 3 Brass cleaning gauges See sketch
9. 2 Skimmers " "
10. 1 Stone Pork
11. 1 Wheelbarrow (all wood) for two Casting machines
12. 2 Brooms for general cleaning (2 machines)
13. 2 Scrub brushes screwed to a 4 ft. stick - For cleaning rubber roll in each casting machine.
14. 2 Soft wire brushes 2½ x 8" or 10" for cleaning regulus metal rolls of each casting machine, screwed to a 4 ft. stick.
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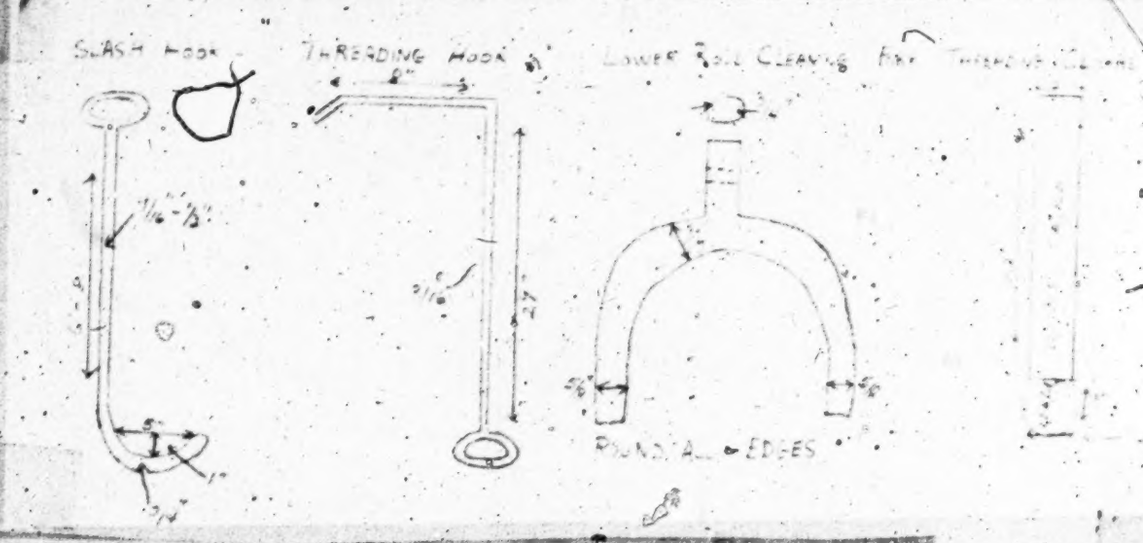

17. 2 Pair rubber shoulder gloves for each casting machine.
18. Rubber gloves for wet end of machine operators.

CASTING MACHINE FILM - Average Cost:

Average cost for the first six months of 1923 of making Cellophane in France is given in detail below. The actual production for the one month of July, 1923, is also shown. The average production per month for the four casting machines was 1842 kgms. per day of 24 hours. For reference, the average American price of the various essential raw materials is given also. A good percentage of the bag, tube and box work of the finishing department at Bezons is handled on a piece-work basis. The figures above condensed are given herewith as well as the unit cost of dry film at the end of the casting machine.

	Machine No. 1	Machine No. 2	Machine No. 3	Machine No. 4
August 27	11.500 M.	10.700 M.	18.950 M.	9.000 M.
" 28	14.000	18.400	22.900	25,500
" 29	- -	20.550	13.850	22.400
" 30	750	20.900	19.400	26.750
" 31	9.500	17.150	30.900	24.000
September 1	10.300	16.450	17.200	25.750
" 6	- -	1.000	27.400	27.100
" 7	- -	- -	30.000	27.750
" 8	- -	- -	27.450	31.250
" 10	- -	18.800	27.700	30.700
" 11	- -	21.950	31.400	34.700
	46.050 M.	145.900 M.	267.150 M.	284.900 M.

AMOUNT OF RAW MATERIAL FOR ONE KILO OF PELLICULE GROSS WEIGHT AT END OF DRYER

MONTHS 1923	Total Kgs. Prod.	Paper	NAOH	CS2	$(NH_4)_2SO_4$	H_2SO_4	NA_2S	C L	HCL	GLY
		Kgs.	Kgs	Kgs	Kgs	Kgs	Kgs	Kgs	Kgs	Kgs
Jan.	42,544	1.45	2.31	0.46	1.02	2.07	0.01	0.23	0.28	0.28
Feb.	44,816	1.17	1.38	0.45	0.89	1.97	0.01	0.11	0.29	0.25
Mar.	45,881	1.18	1.90	0.48	0.86	2.27		0.13	0.39	0.22
April	39,384	1.41	2.03	0.57	0.93	1.77	0.006	0.16	0.32	0.20
May	49,497	1.29	1.91	0.48	0.74	1.78	0.004	0.14	0.38	0.25
June	54,293	1.29	1.88	0.52	0.89	1.86	0.003	0.19	0.23	0.26
July	50,858	1.29	1.77	0.56	0.70	2.09	0.008	0.23	0.36	0.20
Aug.	54,446	1.48	1.81	0.51	1.11	2.15	0.011	0.12	0.44	0.17

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AVERAGE EXPENDITURE

for 6 Months

Number of days of Labor - 25

Output of pellicule Bought 46,069 Kgs

Per day 1,842 Kgs

RAW MATERIAL	Amount Used	Price Per 2 Kgs	Total in Francs
Viscose	**Kgs.**	**Frs**	**Frs**
Paper	59,806	195.	116,621
N A O H	87,600	104	91,104
C S 2	22,008	130	29,780
Spinning			
$(NH_4)_2 SO_4$	40,919	128	52,376
$H_2 SO_4$	89,990	21	18,898
$Na_2 S$	347	145	503
C L	7,312	149	10,895
K C L	14,752	23.50	3,467
G L Y	11,580	430	49,794
Finishing			
Miscellaneous			13,728
LABOR			
Viscose			26,857
Spinning			36,402
Finishing			66,473
GENERAL EXPENSES			
Electricity			46,017
Water			1,015
Gas			844
Fuel			25,203
Labor			6,842
Labor			33,984
Supplies (tools surplus pieces)			117,189
Administration			92,372
Miscellaneous			89,092
Sales Expenses			42,990
Total Expenses			645,422

MONTH OF JULY, 1923.

MANUFACTURING COST PER 100 KG.

NUMBER OF WORKING DAYS - - 25.

SEMI-FINISHED FILM KGS. 50,858 - FINISHED FILM KGS. 44,245

DAILY AVERAGE - 2,034 DAILY AVERAGE - 1,769

RAW MATERIAL	QUANTITY	PRICE PER 100 KGS.	TOTAL IN FRANCS	COST OF 2400#	COST OF SEMI-FIN. FILM	COST PER 100 KGS. FIN. FILM
					Fgs. Frs.	
Viscose						
Wood Pulp	65,900	195.	128,505	154	129 252	290
Caustic Soda	90,520	105	95,046	114	177 186	214
CS_2	28,700	130	37,310	42	56 73	84
Casting						
$(NH_4)_2 S O 4$	35,700	107	43,542		70 85	98
$H_2 S O 4$	106,660	21	22,398		209 44	50
$NH_2 S$	434	145	629		08 1	1
Chlorine	9,600	165	15,899		23 31	35
HCL	18,340	23.50	4,357		36 8	9
Dyes						
Glycerine	10,500	455	53,126		80 104	120
Finishing						
Miscellaneous			16,033			36
LABOR						
Viscose			41,681	50	81	94
Casting			44,046		86	99
Finishing			77,309			174
GEN'L EXPENSE						
Power						
Electricity			57,536			
Water			7,355	160	282	301
Gas			1,045		281	323
Coal			27,660			
Labor			7,893			313
General						
Labor			38,225			
Supplies			116,955			
Administration			84,344			
Miscellaneous			75,412			
SALES EXPENSE			33,642			76
MANUFACTURING			1,029,747		1,496	2,317

CONDENSED COST SHEET

Average Monthly Expenditures for Six Month Period

January to June Incl. 1923.

Societe la Cellophane, Bezons.

46,069 Kg. = 101,536 lbs. Film Produced [illegible]
Exchange at $0.0532 - 12/13/23.

Crude Film at End of Casting Machine Dryer:

Raw Materials		-	373,438 Francs
Labor		-	65,259
Power	(80% of total)	-	64,025
Gen'l Expense	(70% of ")	-	105,751
Administration	(70% of ")	-	105,318
Total			713,791 Francs = $37,973.68

Finishing:

Raw Materials		-	13,724
Labor		-	66,473
Power	(20% of total)	-	15,986
Gen'l Expense	(30% " ")	-	45,322
Administration	(30% " ")	-	45,136
Total		-	186,641 Francs = $ 9,929.30

Sales Expense: - 42,990 Francs = $ 2,287.07

Grand Total: 943,422 Francs = $50,190.05

Unit Cost of Crude Film at End of Casting Machine:

- 15,494 Fr.	per Kilo
0.374	per pound
0.433 Fr.	per Sq. Meter (Up. Gr. 1.4, Sheet 0.02mm thick
0.01485	per 1000 sq. in. (" " " thick)

CASTING MACHINE

GENERAL REMARKS

WATER IN FILM:

Water in film going into dryer, water tank #13, before glycerine bath:

Cellulose 15 to 17%

Water 85 to 83%

When film is passed through glycerine bath the amount of water replaced varies with length of time film remains in contact with glycerine; if long enough, 90% of water is replaced by glycerine.

Assume glycerine bath of density 1.012 at 20° C., i. e., 5% glycerine:

Before Glycerine Bath		After Glycerine Bath	
Cellulose	15%	Cellulose	15%
Water	85%	Glycerine & Water	85%

Actual Composition

Cellulose	15%
Glycerine (1/20)	4.25%
Water	80.75%

From Dryer:

Cellulose	75%
Water	10%
Glycerine	21.25%

6.25% glycerine said to be evaporated in dryer.

From Dryer, calculated:

	Cellulose	55.15% + 15 =	70.15%
100%	Glycerine	15.62 + 4.25 =	19.87%
	Water	10.00 + 0 =	10.00%
			100.00%

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ABSORPTION OF WATER BY FILM CONTAINING [illegible] PERCENTS OF GLYCERINE

Dry Film			Film After Water Treatment		
100 Parts Dry Film			**160-170 Parts Wet Film**		
0	"	glycerine	0	"	glycerine
10	"	water	70	"	water
90	"	cellulose	90	"	cellulose
100 Parts Dry Film			**170 Parts Wet Film**		
18	"	glycerine	0	"	glycerine
10	"	water	98	"	water
72	"	cellulose	72	"	cellulose
100 Parts Dry Film			**160 Parts Wet Film**		
40	"	glycerine	40	"	glycerine
10	"	water	110	"	water
50	"	cellulose	50	"	cellulose

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Dry Film	Film after H_2O Treatment
100 parts Dry Film	170 parts wet film
18 parts glycerine	0 parts glycerine
10 parts water	98 parts water
72 parts cellulose	72 parts cellulose
100 parts dry film	160 parts wet film
40 parts glycerine	0 parts glycerine
10 parts water	110 parts water
50 parts cellulose	50 parts cellulose
100 parts dry film	160 parts wet film
0 parts glycerine	0 parts glycerine
10 parts water	70 parts water
90 parts cellulose	90 parts cellulose

CLARITY OF CELLOPHANE:

The clarity of cellophane depends upon viscose having an index of below 1.6; cellulose content of 6.3 to .5; complete desulphuring; freedom from lead, iron, etc. in bleach and acid baths; thorough washing of the film to prevent deposit of Na_2SO_4; the use of clean water especially at crepe wash points; the use of clean glue solutions properly applied.

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INDEX AND VELOCITY

LIMITS FOR GOOD FILM

INDEX AND VISCOSITY

At the discharge of the viscose mixers, the most satisfactory index is from 1½ to 1⅔; viscosity, 150 to 180 (Bezons standard). For casting purposes, the most satisfactory H_2SO_4-Na_2SO_4 index is 2, and for the ammonium sulphate bath 1 is preferable. Mr. Brandenberger prefers for both baths an index under 1 and a viscosity of 150. One of the best productions from #3 casting machine acid bath was on an index of 1.6, viscosity 200; 37,000 meters in 24 hours were produced. It is better not to have your index below 1 as slight interruptions in film flow might cause solution to solidify. An index above 2 is apt to cause a streaked film; and from 3 up the edges are liable to cut and the film break in many places. As the index increases, it is often necessary to decrease the speed of the casting machine to prevent film breakage. An index of 3½ in acid bath is very apt to cause a spotted film or one filled with gas bubbles. With this index rather than increase acid in bath and hold speed of machine, it is better to slow down machine and hold acid bath normal. A low index viscose (1 to 1½) tends to produce a rapid heating of the coagulating bath and a temperature of 30°C., which is the usual winter casting temperature, is soon reached. It furthermore, causes a smooth-surfaced, shiny film; and, if the mechanical features of the machine be correct, an even uninterupted flow is reasonably assured.

The index determinations at Bezons are made with 10% salt solution and distilled water as at Buffalo; however, the quantity used as 2½ times as large (100 cc.).

5 or 6 drops of viscose are shaken thoroughly in the 100 cc. solution, all being in a stoppered, graduated, glass cylinder. The minimum proportion of salt solution to water which gives a flocculent precipitate is the index of the viscose.

For example:- 10 cc. of 10% NaCl
90 cc. of distilled H_2O
100 cc.

if flocks are formed
Index=1

Index of mixers at Bezons varies from 8 to 16 with 20% NaCl solution used; and an index for casting .6 to 4.4, 10% NaCl solution used. There is a variance of opinion as to the best index for acid bath - anywhere from 1.3 to 2 is considered satisfactory. For alkaline bath 1 to 1½ index is considered satisfactory. It is said that film elasticity increases with the cellulose content of the viscose. It always increases the viscosity and the balance of the desired solution viscosity and film elasticity is obtained by varying concentration of cellulose and ripening time of alkali cellulose.

In connection with the above a little work has been done at Bezons in an endeavor to determine whether or not the Copper No. of the pulp might indicate how long the alkali cellulose should be ripened to give best results.

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Date	Lab Sample	Cu. No.	Sets	Time	% Opening
1919	[illegible] Fellner	6.25	[illegible]	24 hrs.	[illegible]
1920	" "	7.40			7%
1921	Andrews	1.48	10%	40 hrs.	[illegible]
		.72			in
192	[illegible] Fellner	1.54			[illegible]
	" "	1.30	11%	24 hrs.	
		1.47			
1923	[illegible] Fellner	2.81	11%	24 hrs.	8.7%
	" "	2.60			Cellulose
					to Viscose

proper viscosity for casting should range between 150 and 250 sec. as the result increases, the pressure on the casting time must increase increase to keep the thickness of film. Viscosity below 150 is not recommended but 150 is said to be best for thin films. 200 is satisfactory.

The instrument used at Buffalo for solution viscosity determination has a smaller volume and smaller outlet than the one used at Suffolo. A number of comparative determinations were made with the two instruments and the average ratio Suffalo was [illegible] Buffalo

determined as 0.62. The maximum variation from this average of viscosities run by the various persons was -3.7% to +3.6%. Mr. Lanfr (chief chemist)-expressed himself favoring the American viscosimeter because its larger orifice is less sensitive to obstruction. The viscosities of solutions from the mixers (B-20-23) varied from 60 to 420 (Ubbelohde). Viscosity of 300 to 350 is considered proper for casting. If the viscosity should reach 300 or more it is thought to be O.K. At present the viscosity when casting varies from 150 to 250.

From a detailed record of Viscose Charges mixed from September 4th to 12th Inc., the following information is obtained:

100 Solution Mixer Charges

	Index	Viscosity (At Mixer)	
Maximum	16.0	730	
Minimum	8.0	90	
Average	11.07	168.6	
Note: Charge #257	13.2	60)	Not included
" 284	11.4	420)	in above

89 Viscose Blending Tank Charges (at casting machine)

	Index	Viscosity
Maximum	4.4	355
Minimum	0.6	105
Average	1.63	223.6
Note: Charge #257	2.7	90) Not included
" 284	Calculated in Opening Tank	) above

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CELLULOSE CONTENT

For 0.02 to 0.05 m/m films - Viscose (5.3% NaOH (Tot. Alkalinity)
(6.3% Cellulose

Na_2CO_3 should be less than 0.5%

For 0.08, 0.10 m/m films - Viscose (8% NaOH
(10% Cellulose

It is said that the ratio $\frac{NaOH}{Cellulose}$ should be 0.80 to 0.84. A higher ratio (0.90) gives a brilliant surface but a brittle film. During the month of August the laboratory records show a variation in NaOH from 4.75% to 5.69% and in cellulose from 5.80% to 7.17%. A good cellulose content ranges from 6.3% to 6.5%.

ESSENTIAL MATERIALS FOR CASTING MACHINE BATHS

SPECIFICATIONS AND QUANTITIES.

ome is analyzed and those are carried well known 31 ite which are closely adhered to.

[illegible]

[illegible] Boume acid water. [illegible] received in barrels and is blown or [illegible] to cold storage [illegible]. [illegible] is not available daily. [illegible] when. [illegible] Since, 17,600 lit[illegible] are [illegible] for [illegible] [illegible] storage tank six feet in diameter by eight [illegible] long, [illegible] of a point [illegible] iron. Iron content of acid should be held below [illegible] iron the better the quality.

[illegible]

[illegible] delivered by plant by tank wagon and stored in four 1000 liter stone crocks. [illegible] one crock was enough. [illegible] one year old. [illegible] urged from this source to use of a additional 1000 liter stone were crocks [illegible] and [illegible] filling and [illegible] [illegible] [illegible] of crocks of the same specification and quality as those in question.

[illegible] is kept in [illegible] room [illegible]. [illegible] it is heated only for [illegible] [illegible] is finished.

Chlorine:

Chlorine bought in liquid form in containers 8 ft. 6 in. in diameter by 8 ft. 6 in. long, each holding approximately 900 kgms. It is not analyzed, but the bleach solution in which is used is. [illegible] presence of sub[illegible] is objectionable as it causes film to [illegible] [illegible] the test spots.

Ammonium [illegible]:

[illegible] purchased in packages [illegible] each containing [illegible] analysis 95 to [illegible] ammonium nitrate; [illegible] nitrogen. No test for [illegible] is allowed as it [illegible] cellulose, giving [illegible] odor [illegible]. No acidity desired. It is object-[illegible] [illegible] in [illegible] bath.

Glycerine:

[illegible] bought in [illegible] from about 20" in diameter by 40", 400 liter capacity, 500 kgm. weight. Is tested for odor immediately and should be as nearly free of same as possible. Color should not be beyond a light straw. Sp. Gr. is 30° Baume at 20° Cent. No acidity. A maximum of organic matter allowed. Should be free from chlorides or sulphates. Chem glycerine was purchased one season and crystallized in the [illegible] pipes during cold weather. Only the best glycerine is used now. Glycerine melts between 17 and 18° Cent. As has been mentioned previously in this report, too much care cannot be given to the quality of glycerine added to film. It is the last item that enters into the film composition and if there is the slightest objectionable odor or color to it, the quality of the entire run of film will be depreciated. Furthermore, a sheet of film containing bad glycerine will pollute a large pile of film that under other conditions should be first class. The test

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for organic matter is made with lead acetate which gives a white precipitate if foreign organic matter is present. Glycerine with a density as low as 28° Baume at 25° Cent. has been used. Do not mix pure glycerine with any that has been reconcentrated.

SODIUM SULFIDE:

Fused Na_2S in drum form is used as previously described in the desulphuring bath. No tests are made on this for purity. Standard commercial product is used.

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COAGULATING BATH.

COAGULATING BATH HOUSE AND PREPARATION:

Horse, tanks and pumps - See Exhibit .

A two story cement act, brick building as shown on Exhibit is used for the preparation of coagulating baths of casting machines. The roof of this building is built for a water reservoir with a capacity of approximately 120 cu. meters or 33,750 gallons. The second floor of the building is of concrete and contains under it 14 tanks each of 2000 gallon capacity; the ground floor is of like construction and has a similar number of tanks under it. Aforesaid exhibit will give proper location of tanks. All tanks are lead-lined. At present four tanks on the first floor are held in reserve; two are used for the ammonium sulphate bath return from casting machines one and two; two contain ammonium sulphate bath that has passed through lead plate - canvas filters; one for the sulphuric acid - sodium sulphate bath return from casting machines three and four; one glycerine bath return from all casting machines; one reconcentrated glycerine that has passed through filter under reconcentrating tower; two bleach bath return from casting machines; one contains spare ammonium sulphate - sodium sulphate bath.

The second floor tanks are distributed as follows:

Four - ammonium sulphate-sodium sulphate bath storage for feed to casting machines.

Two - ammonium sulphate-sodium sulphate bath fortifying tanks.

One - H_2SO_4 - Na_2SO_4 bath feed to casting machines.

One - new glycerine feed to casting machines.

One - glycerine that is to be passed through concentrating tower.

One - reconcentrated glycerine feed to casting machines.

Two - bleach bath feed to casting machines.

Two - tanks held as spare for concentrated H_2SO_4 storage or H_2SO_4 - Na_2SO_4 feed to casting machines. Building is steam-heated and has no temperature control. Solutions are handled from tanks on first floor to tanks on second floor by iron frame, single acting, single cylinder vertical plunger pumps of the following composition:

H_2SO_4 - Na_2SO_4 bath is handled by one iron frame pump with regulus metal piston and chemica ware cylinder. Bleach solutions, two cast iron frame regulus metal piston, hard rubber cylinder. Ammonium sulphate-sodium sulphate bath, three cast iron pumps, regulus metal piston and chemical ware cylinders. Glycerine bath - one centrifugal regulus metal pump.

PIPE LINES AND VALVES:

Lead lines are used throughout this building with the exception of the feed from the hydrochloric acid chemica ware crocks. Here hard rubber piping and valves are supplied. No valves are used in the lead lines for the other baths. Pieces of soft, pure rubber are clamped over breaks in lead lines where valves

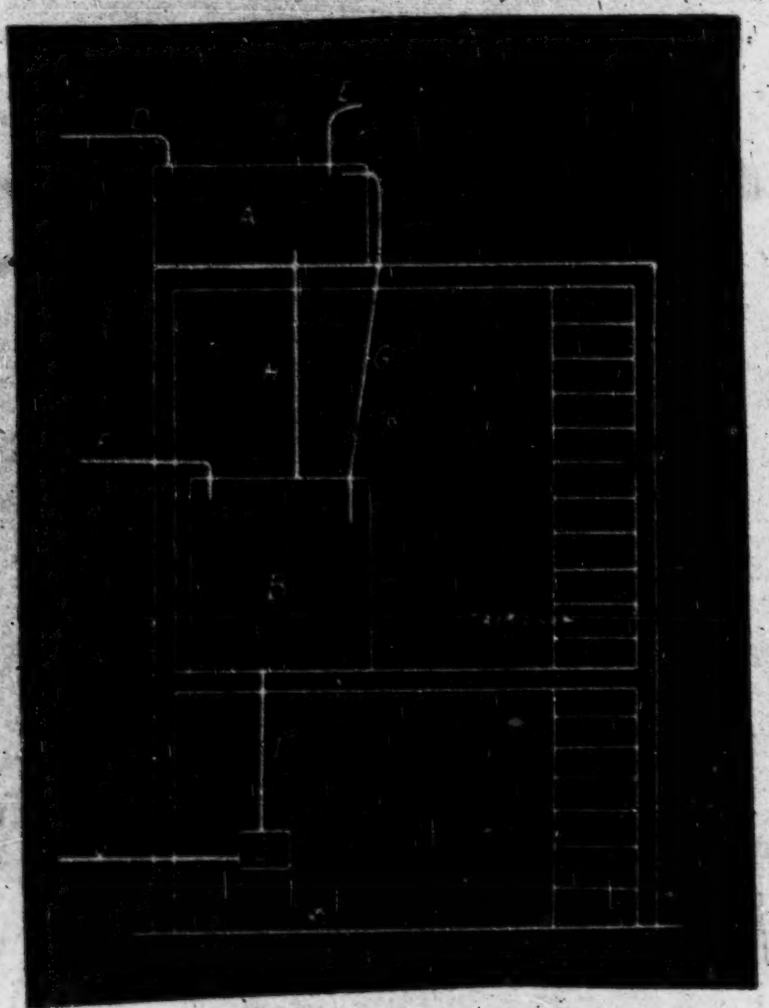
would be placed and the flow through these rubber pipes is controlled by wing nut clamps. Standard gate and disc valves are used on water and steam.

HCl PIPING:

The hydrochloric acid is received at the plant by tank wagon and is discharged by gravity into any one of four 250 gallon stone ware crocks that are located in the open uncovered except for the standard chemical ware crock cover. From these crocks the acid is syphoned as desired into one of two 250 gallon stone ware crocks located in a concrete plank-covered pit adjoining but outside of the chemical house. From here it is pumped by a hard rubber centrifugal pump to one of 250 gallon stone ware crocks located on the second floor of the coagulating bath house. Syphon feed from either of these two crocks supplies hydrochloric acid baths of the four casting machines.

GLYCERINE CONCENTRATOR:

Adjoining the coagulating bath house is an uncovered glycerine concentrating set. The overflow from glycerine tanks of four casting machines return to a sump tank under first floor of coagulating bath house; is pumped to a tank under second floor of coagulating bath house, and from this gravitates to Tank A of concentrator. (See sketch)



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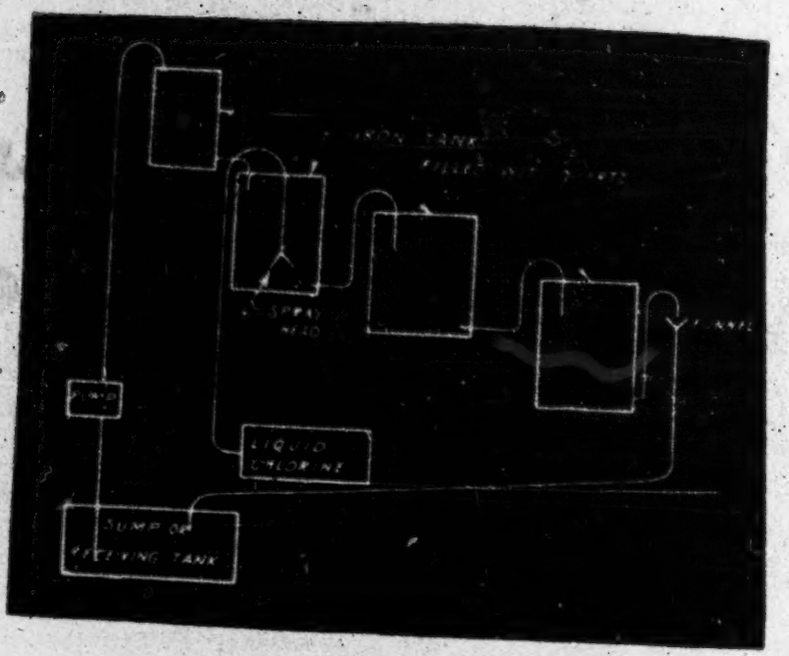
by heat application, iron steam coil in concentrating tank, water is evaporated and glycerine brought down to proper sp. gr. Tank A will hold two casting machine glycerine tank charges. It is of 2-3/4" wood unlined, 38-1/2" wide, 72" long, 16" deep and contains iron steam coil. Glycerine from tank under second floor of coagulating bath house gravitates from iron pipe D to Tank A. An overflow iron pipe G from Tank A discharges to a steel tank B, 48" in diameter, 38" deep. This tank likewise contains a steam coil merely to keep it from freezing during winter weather. N is a line for emptying tank A into tank B, or to drain as desired. L is a line so arranged that solution from B can flow either through 12 x 12 wood plate filter, nine plates, or to sewer. Canvas is used as a filtering medium, and filter is manufactured by Societe de Construction Mecanique de Stains, 16 Rue du Louvre, Paris. The consensus of opinion is that the filter in use is too small. It frequently must be washed three to four times per concentrator charge. In the American machine, the filter will be made considerably larger. Glycerine for concentration that is supplied Tank A at times becomes acid; at other times contains sodium bicarbonate that has been supplied in Tank 13 of the casting machine to neutralize any acidity in the film that has been carried over from the hydrochloric acid tank. As soon as heat is supplied Tank A very obnoxious odors are liberated from Tank A. These odors are absorbed by cellophane and it is vital that they be conducted to the air in such location that no cellophane can possibly come in contact with them. The reconcentrated glycerine frequently contains some of this objectionable odor and therefore must only be used in the pain casting machine glycerine bath for film that will be dyed in the dark color dye machines. In this machine the objectionable glycerine is removed in the wash and dyeing baths and pure glycerine is put back in the film at the glycerine bath of the dyeing machine. Particular care must be taken that no film containing reconcentrated glycerine be used on the light color hood dyeing machine or on the gluing machine when it is used for light color work. The objectionable odor of reconcentrated glycerine from one sheet of cellophane were it to be packed in a 500 sheet pack, where the other sheets were made with pure glycerine, would very probably be absorbed by the good sheets. Several claims of size have been made against Societe la Cellophane because reconcentrated glycerine was used in film that was mixed with film made from pure glycerine and the odor of the entire stock was decidedly objectionable. The strict, positive control of the use of reconcentrated glycerine cannot be stressed too strongly. The return from glycerine filter "C" travels through a lead pipe to one of the tanks under first floor of coagulating bath house. From here it may be pumped by Romulus metal centrifugal pump to the concentrated glycerine feed tank under the second floor of the coagulating bath house.

BLEACH BATH AND CHLORINE RECEIVING APPARATUS:
(See flow sheet)

The overflow from the bleach tanks of the casting machines (0.4 to 0.5 available chlorine) returns (see flow sheet) to one of two tanks under first floor of coagulating bath house. When one of these tanks is filled the return is switched to the other and the solution from the first is circulated through concentration towers by one of two hard rubber pumps.

(See sketch next page)



These towers are supplied from liquid chlorine cylinders and from a 220 liter tank that contains caustic from the last half ofsteeping press ram stroke. When chlorine content of the solution has reached 3% it is pumped toone of two casting machine supply tanks under second floor of coagulating bath house. Supply of fortified bleach solution to three casting machines is at the rate of 164 gallons per hour total. The cycle is repeated for the second bleach sump tank.

2000 gallons of return bleach solution at 0.5 chlorine content require about 350 kilograms of chlorine to fortify to 3% chlorine. The fortifying cycle requires seven to eight hours. Two 2000 gallon tanks of fortified 3% bleach solution is sufficient for casting machines 1, 2, 3 and 4.

Should solution become heated during fortifying cycle, add caustic from tank noted. This prevents solution from fuming. No chlorine should be added until solution again becomes cool. The temperature of this solution should not be allowed to rise above 35° Cent.

GLYCERINE. (see flow sheet)

New glycerine is received in drums as per specification. These are hoisted to second floor of the coagulating bath house and are dumped directly into the one new glycerine 2000 gallon storage tank. From this it gravitates to the glycerine bath of any casting machine or dyeing machine as desired. Reconcentrated glycerine is handled as specifically described under glycerine concentrator.

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SULPHURIC ACID. (see flow sheet)

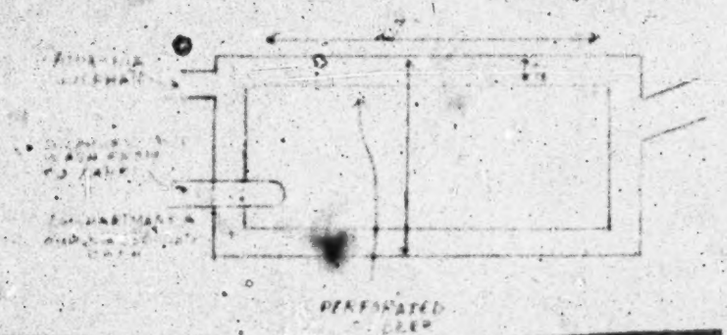
66° Be. acid- (all the specifications given under Essential Materials)- is received by barge and is pumped from the Seine River to two storage tanks located near filter plant. At times acid is delivered by the manufacturer in tank wagon and is blown into storage tanks. From storage tanks it is blown by air pressure to, approximately, 350 gallon feed tank that is located near the roof of the laboratory. A gauge glass shows status of acid here. From this tank is gravitated the supply to the coagulating baths of H_2SO_4-Na_2SO_4 baths.

The H_2SO_4-Na_2SO_4 bath is not circulated. It is returned to sump in coagulating bath house only when machine is closed down. Furthermore, it is not fortified or changed after leaving the machine and is returned to the machine when ready for operation. One sump tank under first floor of Coagulating Building receives the return from acid bath machines when closed down. The bath is elevated to a tank under the second floor of the coagulating bath house and is fed from this to the machines as desired. It is better to keep both of these tanks filled with acid bath after the acid bathcasting machines are supplied. When starting up, allow film to run for a half day; then open the overflow in tank #1 of the machine and allow 1 to 2 liters per minute of bath to return to sump tank. From this tank fill upstairs feed tank and when both tanks are filled plug tank #1 overflow and adjust water supply at tank #3 and acid supply in tank #1 that the proper specification of the bath is produced without overflow being necessary.

Note. The makeup of the H_2SO_4-Na_2SO_4 coagulating bath takes place only in tank #1 of the casting machine. Acid is here added and Na_2SO_4 is produced by the chemical reaction of the viscose and the bath. It is always better to use an old bath for casting. During the first ten hours of film casting with a new bath, one generally finds considerable film trouble and this has been traced to the newness of the bath itself.

$(NH_4)_2SO_4$ - Na_2SO_4 BATH (see flow sheet)

The overflow of the circulating caption bath from tank #1 of the casting machines returns to a mixing box (see sketch)



that is located on the first floor of the coagulating bath house between the two 2,000 gal each sump tanks. To this box also returns acid overflow from tank 2A of caption. (see sketch next page)

duced without overflow being nec

Note. The makeup of the
place only in tank #1 of the cas
Na_2SO_4 is produced by the chemic
bath. It is always better to use
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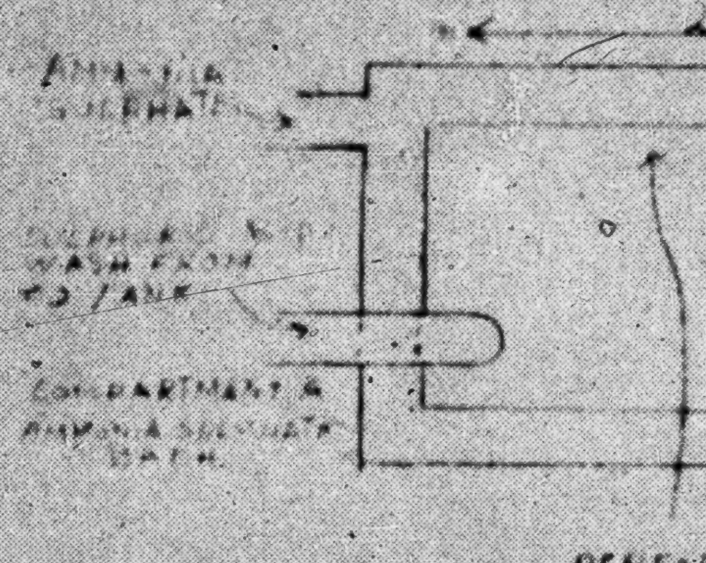
$(NH_4)_2SO_4$ - Na_2SO_4 BATH (see fi

The overflow of the cir
of the casting machines returns



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H_2SO_4-Na_2SO_4 congulating bath takes
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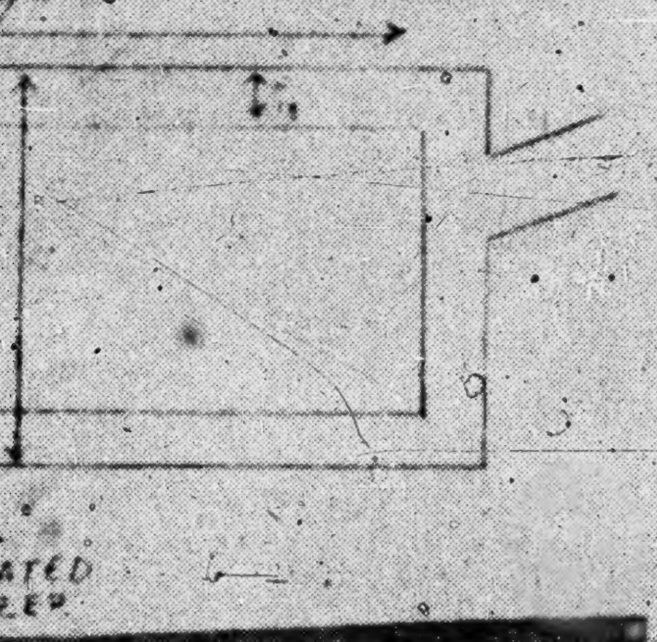

or of the congulating bath house
ump tanks. To this box also
EA of caption. (see sketch next page)

Sketch will show how these two supplies mix. The supply from tank 2A should be arranged that all or part of it can by-pass the mixing tank.

After the two baths are mixed, the color alone tells whether too much of the overflow from 2A has been added to the return from tank #1. A dark cider color, yellow-edged and yellow-cast bubbles, shows the best mix. Should this become a lighter brown or approaching a milky opaque, too much acid is mixed with the alkali and a part of the flow from tank 2A should be by-passed around the mixing box to sewer. The addition of overflow from 2A causes a decided economy as it saves 350 grams of ammonium sulphate per 2.2 lbs. of film produced. The effluent from the mixing box flows to one of two sump tanks under the first floor of the coagulating bath house. It is pumped, as previously described, to one of two tanks under the second floor of the bath building, which are mechanically agitated. Here sufficient $(NH_4)_2SO_4$ in crystal form is added to bring bath to desired strength. At present Bezons is using 400 Kg. of ammonium sulphate to 2,000 gal. of return bath. If the analysis of the solution varies more than 0.5% from 20 grams per liter, the addition of $(NH_4)_2SO_4$ in crystal form is varied 100 kg. to correct the percentage. It requires generally one hour to mix a 2,000 gal. lot. This is allowed to settle for an hour before being passed by gravity to one of three 24-plate center feed 24 x 24 canvas medium wood plate filters. The discharge from each plate is through a wooden petcock to a lead trough, from which it flows to one of two filtered $(NH_4)_2SO_4$-Na_2SO_4 bath sumps. From these it is lifted to one of four tanks under the second floor of the bath building and from these gravitates to the casting machines. The composition of the bath desired for the supply to the casting machines is as follows:

.02 to .05 mm.	20 grams (17.4%) of $(NH_4)_2SO_4$ per 100 cc. and	
	10 " (8.7%) " Na_2SO_4 " " "	
.05 to .12 mm.	25-28 grams (21.3-23.4%) $(NH_4)_2SO_4$ per 100 cc. and	
	10 " (8.5%) of Na_2SO_4 " " "	

No concentrated bath of higher $(NH_4)_2SO_4$ content than 20 grams per

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100 cc. is stocked inasmuch as films of greater thickness than .05 mm. are rarely made.

The composition of caption bath return and of the return from the overflow of tank 2A of this bath has been approximately determined.

ALKALINE BATH RETURN:

$(NH_4)_2SO_4$	15	grams per 100 cc.	
Na_2SO_4	9-11	" " " "	
NH_3	0.5	" " " "	(Total alkalinity)
$(NH_4)_2S$ & Na_2S	0.35	" " " "	as NaOH

OVERFLOW FROM TANK 2A:

$(NH_4)_2SO_4$	5-6	grams per 100 cc.
Na_2SO_4	5-6	" " " "
H_2SO_4	0.5	" " " "

Test effluent from mixing box with litmus to make sure it is alkaline; also the overflow from tank 2A of this bath to see that it has not become alkaline. Should this overflow become a light yellow or brown, the carry-over of alkali in the film from the coagulating bath has neutralized the acidity of compartment 2A and has caused it to become alkaline. In this case, increase the flow of water in tank 3D and it will carry more acid to tank 2A.

The filtration of the return caption bath takes from it quantities of iron sulphide which appears on the filter plates in the form of a black powder. About 20 kg. of it is obtained from one 2,000 gallon bath of filtration.

Filters are taken down and washed about every 6,000 gallons of solution filtered. New cloths are put on every six months.

One large concentrated bath is analyzed daily for $(NH_4)_2SO_4$, and the results of this analysis are used to determine the amount of ammonium sulphate to be added during the day. At present Bezons is using 400 kg. of ammonium sulphate to 2000 gallons of return bath. If the analysis of the solution varies more than 0.5% from 20 grams per liter, the addition of $(NH_4)_2SO_4$ in crystal form is varied 100 kg. to correct the percentage.

BATH TESTING:

It would be advisable to test each of the chemical baths in tanks, 1, 2, 3, 6, 9, 11 and 14 of the casting machine each hour when a machine is started in operation.

GLYCERINE BATH:

Glycerine baths are returned to the coagulating bath house only to reconcentrate glycerine. The actual bath is prepared in tank 14 of the casting machine and varies according to the thickness and quality of the film desired. For films requiring 18% of glycerine, the density of the glycerine solution at 20° C. is 1.010 - 1.020 and new glycerine is added to the center of tank 14, incoming

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end, at the rate of one to two liters per minute. Should film containing 40% glycerine be desired, the density at 20° C. is increased to 1.060 and the rate of new glycerine addition increased to three to four liters per minute. Table herewith gives film thickness, percentage of glycerine in film and density of glycerine solution at 20° C. used. For Cellophane that is to be used for embossing, it is always advisable for it to have a glycerine content of at least 20%.

Thickness of Film	% Glycerine in Film	Density Glycerine 20°C. Solution Used.
0.020	18	1.010
0.030	18	1.012
0.050	18	1.014
0.080	18	1.016
0.100	18	1.018
0.120	18	1.020
0.020	40	1.060
0.050	40	1.060

The glycerine overflow normally returns at the rate of one to two liters per minute and at a density of 1.01 to 1.02.

In starting up a new machine, tank 14 is filled to the proper height with water and then new glycerine added. New glycerine has a density of 1.24, 28° Be., to 1.26, 30° Be. At times the glycerine bath becomes acid, due to carry-over from hydrochloric acid tank; this causes film to become opaque. In this case add one gm. per 1,000 cc. of bicarbonate of soda either directly to the glycerine bath or to wash water tank 12. The presence of this bicarbonate of soda causes unpleasant odors when glycerine return is reconcentrated.

COAGULATING BATH ROOM LABOR:

One man is required for each shift for regulating baths and one additional man on the day shift for washing filters - total 4.

BATH HOUSE SUPERVISION:

The control of the Bath House as well as of its force is vested in the Chief Chemist at Bezons.

CASTING MACHINE BATHS

CASTING MACHINE BATHS -- Characteristics, control and operation.

In order that the methods of operating the casting machine on the two kinds of coagulating bath may not be confused they will here be described separately for Tanks 1, 2 and 3. From tanks 4 to 14 the operations are the same. $(NH_4)_2SO_4$ coagulates viscose more slowly and prohibits the machine operating as fast as with acid bath. Acid bath -- 25 meters; $(NH_4)_2SO_4$ bath -- 18 to 20 meters per minute.

ACID BATH - (H_2SO_4 & Na_2SO_4)

This bath can be used only for 0.02 mm and 0.03 mm film. Lack of transparency and gas bubbles forming in heavier films prohibit its use.

Coagulating bath specification, Tank No.1 - 10 gm H_2SO_4) per 100 cc
10 gm Na_2SO_4)

In actual practice sulphuric acid bath is kept as follows :

H_2SO_4 - 8 - 12 g/100 cc. - 10 g is almost right for index 1.5 - 2.3 .02 mm.

Na_2SO_4 - 10 g/100 cc - 10 g is almost right for index 1.5 - 2.3 .02 mm.

Temperature - 20-25°C winter. - 20-37°C summer. Apply heat at start only. Reaction supplies it thereafter.

12 g/100 cc H_2SO_4 is only used when unripe viscose is used.

2-1/2 - 3.35 and then H_2 bubbles generally appear in film.

Below 8 g/100 cc H_2SO_4 color is not clear and edges not strong.

Tank #2, Compartment A - 5-7 gm H_2SO_4 per 100 cc.
" " " B - 3-5 gm " " "
" 3 " C - 2-2.5 gm " " "
" " " D - 1-1½gm " " "

(Five samples of Tank 3, Compartment D, analyzed by W.Lenfry showed acidity (H_2SO_4) of 1.8 to 3.1 gm and Na_2SO_4 content of A, B or C was obtainable.

The acidity is the only factor over which any control is exercised and is regulated by the addition of 66° H_2SO_4 to Tank #1. This is not a circulating bath. Bath returned to coagulating bath house only on shut down. The only overflow in the first three tanks is at 3 D (to sewer) here water is also added to keep level constant. As shown on the sketch, there is a solution flow from 3 D to 3 C to 2B to 2A to Tank #1. When using acid bath this flow is through holes, 2" diameter and 4" below bath level, in the partitions of Tanks 2 and 3 and through 2" pipes at the same level which connect Tanks 1 and 2 and Tanks 2 and 3. The solutions do not flow over the partitions nor through the weir between Tanks 2 and 3.

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CASTING MACHINE - Cont'd

The amount of coagulating bath carried out of tank #1 by the film is greater than the addition of viscose and H_2SO_4. Hence, the flow of solutions mentioned above is necessary to keep the level in Tank #1 constant.

H_2SO_4 addition to Tank #1 is at the rate of 3/4 to 1 liter per minute (max. consump. 2000 Kg. per day).

Tank #1 bath temperature 20 degrees to 25 degrees winter; 30 degrees to 37 degrees summer. Heat is used only when starting. The heat of the reaction is said to maintain the temperature.

To make up new bath use Glauber's salt or NaOH and H_2SO_4 to give the required composition. A new bath does not work well for about ten hours or until considerable sulphur is precipitated.

H_2O addition at Tank #3, con't. D is about 3 liters per minute. It is said that if squeeze rolls are used between Tanks 3 and 4 no addition of water is necessary at D.

Tanks 2 and 3 should be at room temperature, 20 degrees to 30 degrees centigrade. Tanks 2 and 3 are dumped to the sewer and washed out about once in two weeks. When being refilled they are made up to the required acidity with H_2SO_4 and H_2O. No Na_2SO_4 is added at this time but is formed by the casting reaction.

The storage tanks for acid bath in the coagulating bath house are kept filled at all times. This is done by returning to them a small overflow from Tank #1 when necessary.

Return for film .02 mm equal overflow or 1-2 liters per minute.

Pump handling H_2SO_4 bath in coagulating bath house equals 800 gal. per hour.

Capacity of tank for receiving this return 2000 gallons.

The overflow is plugged as soon as sufficient bath has been returned. Tank #1 is emptied when shutting down Saturday night by returning to bath house if there is room or by dumping in sewer. Used bath from the bath house is furnished to start the machine on Mondays.

ALKALINE BATH - $(NH_4)_2SO_4$ - Na_2SO_4 - NH_3 (see sketch)

This gives a more transparent and less brittle film than H_2SO_4 bath. May be used for film as thick as .12 mm.

When alkaline ammonium sulphate bath is used the film is precipitated as the xanthate which is converted to cellulose by the H_2SO_4 solutions in tanks two and three. The bath is circulated continuously and control is maintained by the rate of flow.

Composition of Fortifying concentrated Bath coming to machine for films 0.02 to 0.05, - 20 gms. $(NH_4)_2SO_4$, 10 gms. Na_2SO_4 per 100 cc.

This bath should never be allowed to become acid or iron will be dissolved and discolor the film. The best alkalinity is about 0.18% total - calculated as gms NH_3 per 100 cc.

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CASTING MACHINE - Continued

The bath in coagulating Tank #1 is controlled entirely by its $(NH_4)_2SO_4$ content which should be as follows :

0.02 to 0.05 films - 14 to 16 gms. $(NH_4)_2SO_4$ per 100 cc.
.02 to .05 " Na_2SO_4 9 " 11 gms per 100 cc
.05-0.08 to .010 " 20 " 28 " $(NH_4)_2SO_4$ per 100 cc.

The rate of addition of concentrated bath is 12 to 15 liters per minute.

Return for thin film is almost same as addition. For thick film the return is greater than the addition.

Capacity of pump from coagulating bath pump is 50 liters per minute.

Capacity of pump from filtered solutions to supply tank is 400 gallons per hour. Receiving and storing tanks in coagulating bath house are each 2000 gallons. Capacity of coagulating bath on machine is 400 gallons.

In starting machine with a new bath of $(NH_4)_2SO_4$. The Na_2SO_4 content must be obtained by the addition of caustic soh and H_2SO_4.

Bath temperature - 30 degrees to 35 degrees C. Heat is necessary at times to keep the temperature up.

Tank #1 overflow returns to bath house.

In operating tanks 2 & 3 with alkaline coagulating bath the interconnecting holes are plugged. Flow from one tank to another is over partition or through a connecting weir. The direction of flow is from A to B to C to D where an overflow pipe leads to the bath house or sewer as desired. The addition of H_2SO_4 is made in Comp't. B and D water in Comp't. C.

H_2SO_4 - about 3/4 liter per minute.

D water - about 1/3 liter per minute.

The desired concentrations in tanks 2 and 3 are :

Compartment A - 0.6 gm H_2SO_4 per 100 cc.
" B - 8-10 " " " "
" C 6 " " " "
" D 3 to 4 " " " "

(In tank 3 D, $(NH_4)_2SO_4$ will be a out 5% and Na_2SO_4 about 5%)
If tank 2 A becomes alkaline as sometimes undesirably happens a little faster addition of water @ 3 D will rectify it by carrying.

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CASTING MACHINE - Cont'd

over more acid from 2B to 2A.

The solutions flow over the partitions and weirs as indicated by the heavy arrows.

The overflow from 2A returns to the coagulating bath house and is mixed in a lead mixing box with return from the $(NH_4)_2SO_4$ - Na_2SO_4 bath from Tank #1. ~~(See sketch 1-1/2 x 2-1/2~~

Color of discharge from mixing box tells when enough of the discharge from tank #2 overflow is added and balance is bypassed to sewer. The mixed returns should give a dark cider color showing yellow edges and bubbles. If it is lighter approaching a milky opague, the mixture is acid, due to too much of return from Tank #2 overflow having been added. A good bath for Tank #1 should always be alkaline. The discharge from mixing box flows to pump tank in coagulating bath house. In practice practically all the overflow from tank 2A is mixed with the overflow of the $(NH_4)_2SO_4$ - Na_2SO_4 coagulating bath and it results in a saving of 350 grams of ammonium sulphate per kg. of film made.

TANK #4

Wash water @ 20° to 30°C. should never be over 30° or H_2SO_4 will attack film. Flow of water - 100 L per min. or more if possible to maintain temperature.
Overflow to sewer. Unfiltered water may be used.

TANK # 5

Same as #4 but water may be heated to 50° C. if necessary to shrink width of film. Same flow through it.

TANK # 6

Desulfuring bath @ 90° plus C hold between 90-100°C. but do not boil. Never get as low as 80°C. Supplied with waste caustic from last half of steeping press stroke. Maximum consumption 12-20 liters per hour. There is no overflow pipe but one should be provided to prevent occasional spills on the floor. Drained and washed out

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weekly. Rolls collect $CaCO_3$ and are washed with 10% HCl and water.
0.02 film------- 0.4 to 0.6 gm. NaOH per 100 cc.
0.05 " ------- 0.8 to 1.0 " " " " "
0.08-0.10------- 1.0 to 1.2 " " " " "

Any white spots in the film after emerging from #7 wash tank indicate the need of more NaOH in #6. If desulfurization is difficult, 3 or 4 kgs. Na_2S may be added to Tank #6. Too much NaOH gives a weak film.

For 0.05 to 0.08 film one-half the total alkalinity is always Na_2S. 1 or 2 kg. Na_2S are added every hour or half hour as needed.

Return to sewer.

TANK #7

Wash water. Temperature 90° C. Flow as great as possible without lowering the temperature too much. Overflow to sewer.

TANK #8

Wash water. Temperature 20° to 30° C. Flow 100 liters per minute or more if temperature can be held. Overflow to sewer.

TANK #9

Hypochlorite bleach. Concentrated bleach solution, 3% available chlorine and 0.7% NaOH fed to the bath in sufficient quantities to keep the bath approximately as follows :
For 0.02 film ---- 0.5 gm. Cl per 100 cc
0.04 " ---- 0.8 " " " " "
0.10-.12 " -1.6 to 2.0gm. Cl per 100 cc

Bath @ room temperature - 20°C. Supply no direct heat. 25°C. is too high and 10°C too low, but better 10° C than 25°C. Hold as near 20°C as possible. Overflow returned to bath house for fortification. Maximum consumption of concentrated bleach - 8000 liters per day = 3 liters per min. One can tell by film color if bleach is sufficient. If film is yellow, increase Cl. content of bleach, add 2 liters of 3% bleach solution per minute. Return to coagulating bath house pump is at the rate of 2-3 liters per minute. Circulation of the bath is continuous and said to be at the rate of 154 gallons per hour for three machines. No water is added.

TANK #10

Wash water @ 20°-30°C. About 50 liters or as much more as will not affect the temperature flow of water per minute. A small amount of chlorine remaining after washing gives a better bleach in the HCl bath but makes chlorine fumes around the machine very objectionable. Overflow to sewer. This tank has removed excess Cl from film so fumes will not be objectionable when it reaches HCl bath. It is better not to increase Cl content from .02 above 0.5 g/100 cc as a stronger concentration does not improve film color and greatly increases difficulty in washing acid out of film in wash tanks preceeding glycerine bath. Add 10 liters 22°B HCl per hour. Return to sewer.
It is better to feed the tank with inlet under surface of tank liquid It will lessen fumes.

TANK #11

HCl bath, temperature 20° to 25° C. Do not supply direct heat. Tank supplied with 22° Be Hcl to keep concentration,-

for .02 film - .5 to 0.6 HCl
.03 " - 0.6 "
.10 " - 01.0 "

Maximum consumption - 300 liters conc. HCl. per day.
Overflow to sewer.

It is better not to increase acid content for .02 mm above zero .6 grams per 100 cc as a stronger concentration does not improve film color and greatly increases difficulty in washing acid out of films in wash tanks preceeding glycerine bath.

Add 10 liters 22°B Hcl per hour. Return to sewer. It is better to feed this tank with inlet under surface of tank liquid. It will loosen films.

TANK #12

Wash water @ 20° to 30° C. Flow 100 liter or more per minute. Overflow to sewer.

TANK #13

Wash water @ 30°C. Flow 100 liters per minute. Overflow to sewer.

TANK #14

Glycerine solution @ 20° to 30°C. For film with 16 to 18% glycerine after drying:

0.02 film - 1.010 Sp.Gr.of bath @ 20°C.
0.03 " - 1.012 " "
0.04 " - 1.013 " "
0.05 " - 1.014 " "
0.06 " - 1.015-16 " " (- 5°C. = -.001 Sp.Gr.
0.08 " - 1.020 " "
0.10 " - 1.030 " "

Film for embossing must have 20% glycerine, 0.02 - 1.012 Sp.Gr.
Pharmaceutical film - 40% glycerine:

0.02 film - 60/gm per sq. meter - 1.060 Sp.Gr.of bath
0.05 " - 80 gm per sq.meter-1.080 " " " "

The glycerine concentration is maintained by addition of 1.26 Sp.Gr.glycerine - about 98%. Maximum consumption is 300 kg per day.

The glycerine bath always contains 0.8 to 1.2 gms. $NaHCO_3$ per liter to counteract acidity. Add about 100 gms. $NaHCO_3$ per hour. If film becomes acid add 200 or 300 gms. Na_2CO_3 to wash tank #13, Tank #14 overflow to bath house. It is claimed that #252 film 0.02 mm, in a glycerine bath @ 1.010 Sp.Gr. will absorb 20% of the total possible glycerine in 20 seconds. It is also said that between 20° and 30° C. the rate and quantity of absorption do not vary appreciably. However, the time of immersion as a function of casting machine operating speed receives consideration as follows. The specific gravity of the glycerine bath for 0.02 film is 1.010 for a machine speed of 25 meters per minute. This specific gravity is varied directly with increase or decrease of machine speed in the ratio of - 0.0005 Sp.Gr.for - 5 meters per minute variation from the standard speed of 25 meter per minute.

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Below is shown a copy of casting machine record as kept. This is blackboard record - one for each machine. The data is posted in chalk by a lab. boy. A copy is kept in the laboratory in a notebook. - a book for each machine.

It will be noted that some of the columns are useless. - Acidity of $(NH_4)_2SO_4$ bath, "N1", "N2" also, there should be provision for recording acidity of acid bath in casting tank, alkalinity of bleach solution, and perhaps alkalinity of bleach solution, and perhaps alkalinity of glycerine bath. Bath temperature may also be added.

When casting in acid bath, tank 2 Comp't A, is analyzed for acidity. When it exceeds 4 gr. per 100 cc the flow of water in tank 3 - Comp't is increased to prevent waste to sewer.

When casting in alkaline bath, tank 2 - Comp't A, is analyzed for acidity to return to bath house for mixing with returned $(NH_4)_2SO_4$ bath. Tank 2- Comp't B is also analyzed for acidity to control H_2SO_4 supply at this point.

Date	Time	$(NH_4)_2SO_4$ Bath		Acid Bath				Desul-furing	Bleach		Glycerine		Viscose	Remarks
		Feed		Feed		Overflow		NaOH	Temp.	Chlorine	HCl	Sp. gr.	Temp.	Index	Viscosity	
		$(NH_4)_2SO_4$	H_2SO_4			A	B									
				Tank No.2, Comp't A.-Casting Machine		1	2									
				" " 2 " B " "		2	1									
				" " 3 " C " "												
				" " 5 " D " "												

CHEMICAL CONTROL TESTS ON VISCOSE, FILM AND COAGULATING BATH

ANALYSIS OF [illegible]:

Use Kellner Hartington Pulp (Sulfite)

Alpha Cellulose

Weigh out 2 - 3 grams of wet cellulose of known moisture content. Then macerate with 20 cc. of NaOH solution (215 g. per liter) for one-half hour at 20° C.

Then solution is diluted with about 100 cc. cold water and filtered on a batiste cloth filter. (Vacuum flask) Then washing is continued to remove about all of NaOH. Then pulp on filter is washed with few cc. of dilute acetic and washing continued to complete neutrality. Then pulp is expressed between fingers and dried in oven at 100 to 110° C. to constant weight.

CALCULATION OF ALPHA CELLULOSE:

Weight of wet pulp	3.00 g.
Water 7%	0.21 g.
Weight dry pulp	2.79 g.
Weight dry alpha cellulose	2.50 g.
	.29 g.

$\frac{.29}{279} \times 100$ = % loss

$\frac{250}{279} \times 100$ = % alpha cellulose

The above are not actual results.

Pulp averages about 88% alpha. Beta cellulose made as at Buffalo.

METHOD FOR THE ESTIMATION OF GLYCERINE IN FILM

1. EXHAUSTION:

Weigh 15 gr. of pellicle and cut into small pieces. Transfer to a porcelain evaporating dish containing about 750 cc. distilled water. Heat on water bath for an hour, with agitation from time to time. Then pour the water into a 1000 cc. standard flask. Add again about 200 cc. distilled water on the pellicle and heat again for 15 to 20 minutes. Pour this water into the first. Finally press the pellicle with fingers to remove water as well as possible. Cool the standard flask to 15° C. Complete to 1000 cc. with distilled water and mix thoroughly.

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2. OXYDATION:

Take 50 cc. of the solution above, add 30 cc. of $K_2Cr_2O_7$ solution at 60 gr. per liter. Standardized with $Na_2S_2O_3$, N/10 and 20 cc. H_2SO_4 66°B. Heat for 15 minutes on water bath, pour into a standard flask of 200 cc. Cool to 15°C. Complete to 200 cc. and agitate.

3. Take 25 cc. of the oxydized solution, add to it 10 cc. of KI solution 10%. Titrate immediately iodine-free by $Na_2S_2O_3$ N/10, in presence of some drops of starch solution.

4. CALCULATION:

If 30 cc. bichromate are worth N cc. $Na_2S_2O_3$ N/10 and if n is the number of hypcsulfite cc. added to saturate free iodine, the weight of glycerine contained in 100 gr. of pellicle is found to:

$$\text{Glycérine } \% = \frac{(N-10n)\ 1.312}{15}$$

$K_2Cr_2O_7$ standardized with KI and $Na_2S_2O_3$.

WEIGHT OF FILM PER SQUARE METER:

Thickness	Weight per Square Meter
0.02 mm.	27 grams
0.03 mm.	40 grams
0.05 mm.	68 to 70 grams

Multiply thickness by 1.4 or density of cellulose to get weight of square meter.

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CHEMICAL CONTROL TESTS ON VISCOSE, FILM & COAGULATING BATH

FILM TESTS:

A sample from each 1000 meters of film cast is cut exactly one meter long, is tested for thickness by laboratorian and weighed by dryer operator on laboratory balance. The width is measured by laboratory man and weight per square meter calculated. This sample with data on roll number, kind and color of film, date and hour cast, machine number and type of bath, and reaction with litmus is kept in the laboratory one year for reference.

A daily sample from each machine is also analyzed for glycerine. The determination is made by soaking out the glycerine in water and oxidizing with chromic acid.

See Photostat Exhibit [illegible] showing actual control log of French machines.

The instrument used for testing the film for thickness is an automatic micrometer, graduated to read in 1/10th of a millimeter. This machine is made by [illegible], Waltham, Mass. It is approximately the size of an alarm clock and was said to be rather inexpensive.

COAGULATING BATH:

When ammonium sulfate coagulating bath is used it is analyzed every two hours for density and for ammonium sulfate content. A total sulphate determination is not made excepting about once a month for check purposes.

With the sulphuric acid bath a sample is analyzed every hour or oftener, for total acidity and sulfuric acid. No total sulfate determination is made.

DESULPHURIZING SOLUTION:

Sampled every two hours. Is analyzed for total alkalinity.

BLEACHING SOLUTION:

Sampled every hour and available chlorine determination made.

HYDROCHLORIC BATH:

Sampled every hour and acidity determined by adding an excess standard caustic solution and titrating back with standard acid. This procedure is following to eliminate the effect of chlorine on the indicator used.

VISCOSE INDEX AND VISCOSITY TESTS:

An index and a viscosity determination are made for each mixer charge after it has been cooled in cooling tank and before going to Ripening Room. Foreman of house make them and is sometimes checked by boy in laboratory. After charge is two days in Viscose Ripening Room, an index determination is taken once a day until proper index is reached for use. Laboratory does this.

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CHEMICAL CONTROL OF PROCESSES

Steeping Caustic

Specifications, - 240 gms. NaOH per liter=
19.6% NaOH

Method, - Titrate with standard acid.
Every batch of prepared caustic is analyzed.

Alkali Cellulose

Specifications (approx.), - 16.5% NaOH
26.0% Cellulose

Method, - Titrate alkalinity with standard acid.
Wash sample free of alkali and salts, dry and weigh.
Three charges analyzed per day (about 1 in 10)

Viscose

Specifications, - 5.3% NaOH
6.3% Cellulose
Viscosity, - 150-200 at mixer
200-250 at casting machine
Index, - 1.3 to 1.8 for H_2SO_4 bath
1.0 to 1.5 for $(NH_4)_2SO_4$ bath

Method, - Titrate alkalinity with standard acid.
Cellulose determined by coagulating a sample of viscose in regular acid bath from the casting machine, washing, drying and weighing.
Viscosity, - measured in seconds of outflow from a tube smaller capacity and smaller orifice than of Buffalo.
From comparative determinations made with the two instruments at Rezons. $\frac{\text{Buffalo}}{\text{Rezons}} = 0.62$

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Alkalinity and Cellulose are determined on 3 charges per day (about 1 in 10)
Viscosity and Index are run on each solution mixer charge and on each ripening tank charge (3 mixers) daily

Acid Coagulating Bath

Specifications (Casting Tank),- H_2SO_4, 10 gm. per 100 cc =
Na_2SO_4, 10 gm. " " =

Note:- If viscose index is high rather than inc[illegible] the acidity to 12 or 13 gms. per 100 cc it is better to slow down machine and hold normal with acidity.

Method,- Acidity is determined by titration with standard alkali.
No control over Na_2SO_4 content is maintained.
Sampled at least every hour.

Acid Wash Tanks

Specifications (Tank #2, Compart. A),- 7 gm. H_2SO_4 per 100 cc.
No spec. or control for Na_2SO_4

Method,- Titrate acidity with standard alkali.
Sampled at same time as Tank #1
No analyses are made of Tank #2
Compart. B or tank #3, Compart. C and D

Ammonium Sulphate Coagulating Bath

Concentrated bath for 0.02 to 0.05 m.m. films.

Specification,- 20 gms. $(NH_4)_2SO_4$ per 100 cc = 17.4%
10 Gms. Na_2SO_4 per 100 cc = 8.7%
Analyzed for $(NH_4)_2SO_4$ only once daily

Concentrated bath for 0.06 to 0.10 m.m. films

Specification,- 28 gms. $(NH_4)_2SO_4$ per 100 cc = 23.65%
10 " Na_2SO_4 " " = 8.44%
Sampled once daily when being used.

Bath in casting tank - 0.02 to 0.05 films
Specification,- 15 gms. $(NH_4)_2SO_4$ per 100 cc = 13.3%
Sampled every two hours

0.06 to 0.10 films

Specification,- 20 gms. $(NH_4)_2SO_4$ per 100 cc = 17.4%
Sampled every two hours

Method,- $(NH_4)SO_4$ by making alkaline with excess NaOH, distilling NH_3 into standard acid and titrating excess acid.
No analyses or control of Na_2SO_4

Desulphurizing Bath

Specification,- 0.02 mm film, 0.4 to 0.[illegible] NaOH
0.04 mm " 0.8 to 1.0% NaOH

Note,- Concentration varies with ease of desulphurization. When very difficult, 3 or 4 Kg. Na_2S are added to the bath.
For 0.05 to 0.08 m.m. films one half the total alkalinity is always Na_2S.

Method,- Titrate the alkalinity by standard acid.
Sample every hour or oftener.

Hypochlorite Bleach Bath

Concentrated Supply.

Specification,- 3% available chlorine
0.7% NaOH
Sample each charge when prepared

Bleach Tank 69

0.02 mm film,- 0.5% Cl.
0.04 " " 0.8 "
0.10 " " 1.[illegible] to 2.0 Cl.

Method,- Iodimetric titration of chlorine.
Sample every hour or oftener

Hydrochloric Acid Bath

Specification,- 0.02 mm. film, 0.4 to 0.5% HCl
0.03 " " , 0.6 "
0.10 " " , 1.0 "

Method,- Add excess standard alkali, back titrate with standard acid.
Sample every hour or oftener.

Glycerine Bath

Specification,- For 16 to 18% glycerine in film. 0.02 mm film,-4.25% = 1.010 Sp.Gr. 20°c.
0.04 mm film,-[illegible] = 1.013
0.05 " " ,-5.9[illegible]% = 1.014
0.06 " " ,-6.80% = 1.016
0.08 " " ,-8.51% = 1.020
0.10 " " ,-8.51% = 1.020

For 20% glycerine in film (For embossing)
0.02 mm film,- 5.11% = 1.012 Sp. Gr. 20°c.

For Pharmaceutical film,40% glycerine
0.02 mm film,- 24.62% = 1.060 Sp. Gr. 20°c.
0.05 " " ,- 32.20% = 1.080

Method,- Take specific gravity with hydrometer correcting to 20°c.
± 5°c. = ± 0.001 Sp. Gr.

Note,- The glycerine bath always contains about 0.1% $NaHCO_3$
Determine by titration against standard acid.
Sample every hour or oftener.

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(1) Pharmaceutical Film

This film contains 40% glycerine and is .03 mm thick. It is generally dyed slightly brown, by the addition of the basic sulphur dye (Cachou Pyrogene 2 B) to the desulphuring bath. The dye is dissolved in Na_2S and the strength of the Na_2S is kept up by charging Na_2S solution instead of NaOH solution. The percent of Na_2S kept is 0.3%; color 0.3%; NaOH 0.3%. Use the first quality glycerine.

(2) Gutta Percha Film

This film contains 40% glycerine and is dyed with Brun Pyrogene D. S. in desulphuring bath. After drying, talc is dusted on the film to give the color and feel of gutta percha. Before adding the talc, the film must contain over 10% water. First grade glycerine is used in this manufacture. Gutta percha film comes from casting machine dryer not completely dry and goes through to machine that has two fiber brush rolls, one brushes talc into the film and the other removes the excess from the surface of the film. Bath Na_2S 0.3%; color 0.3%; NaOH 0.3%. Use first quality glycerine.

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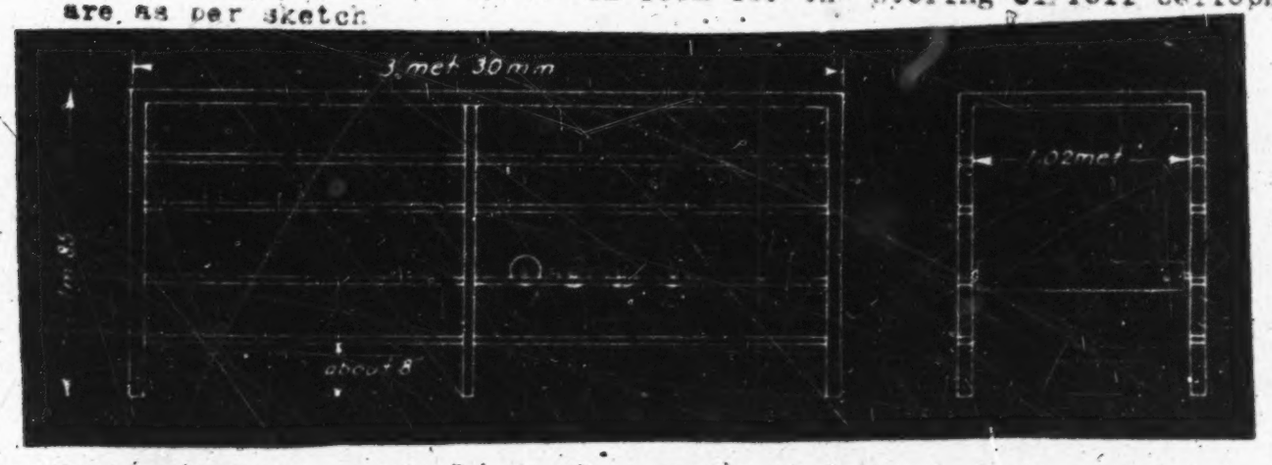
STOCK ROOM

Stock Room.

Rolls of the film from casting machine dryer are stored in racks at the end of casting machine, without segregation of widths. An iron rod 5/16" square by [illegible] is slipped through the hollow cardboard roll on which cellophane is wound and the roll by it is hung in rack shown by sketch.

A stock room operator collects these rolls each day shift and carries them by push truck to the main stock room where all cellophane made is reported. From this room distribution is made to each department and the actual records of the cellophane made, dried, cut, can be taken from the requisition slips through which cellophane is drawn from stock record. To insure economical waste in cutting, cellophane should be aged in the stock room for three or four days.

The racks in the stock room for the storing of roll cellophane are as per sketch



No iron rod is used to hang the roll here; it is supported by the ends of the cardboard roll only. In the stock room segregation of rolls by width to a certain extent is done and cellophane is issued to cutting room for standing on preliminary spools in widths that will cut to the lowest possible waste. Rolls at the discharge end of the casting machine dryer that have thickened stripes or are unevenly or not thoroughly dried should always be specially marked at end of casting machine so that they can be immediately recognized in the stock room. These rolls will be sent as soon as received to a drying machine where the film will be brought to the proper moisture content. This point is very vital, for if a wet film should by chance be overlooked and get with good cellophane the moisture from the wet stock would cause

the good stock to wrinkle and curl in sheets in such a way that it could be sold only as an inferior quality. Cellophane rolls that contains too much moisture should not be stored, under any conditions, longer than a week, as the moisture tends to weaken the cellophane and cause it to stick together as a solid mass. Withdrawals from stock rooms are made by requisition which shows the department withdrawing and the purpose for the withdrawal. Should cellophane be withdrawn for stock dyeing, the dyeing department is given credit for dyed cellophane returned. The difference between that issued for dyeing, the film in process for dyeing, the film dyed and the dyed film shipped for any one period gives loss in the dyeing operation. Cutting withdrawals are handled in a similar way to dyeing. Shipments direct from stock are so noted on the requisition, the order number being given.

Stock Room Construction

The stock room at Nezona is of brick, three sides, and 7/8 slat partition on other side, concrete floor, tile roof with skylights, the underside of the roof being plastered directly on roof joists. Direct heat, steam pipes being run overhead. No temperature or humidity control. But one of the brick walls of this room is exposed to the outside temperature, the other two being inside walls. Care should be taken that no cellophane rack or bin is placed within two feet of any wall which might sweat or through which moisture in any way might be conveyed. Should a wall be made of fresh mortar the same procedure should be followed. Racks should be kept 10" from a perfectly dry wall so that thorough ventilation is allowed for. This room is one in which excessive moisture will cause considerable damage. The cellophane will either stick together so that it cannot be taken apart without tearing, badly wrinkling or blistering, or present such a general appearance that it cannot be sold or handled economically. The best temperature for the stock room is 15 to 18° Cent. and no more than a normal humidity, 65 to 70 should prevail.

Sheet cellophane is stored in dry hardwood racks well constructed. No more than 2000 sheets of each quality and color is stocked at one time and this is used only for supplying small customers. Should an order approach 1000 meters it is always cut from made up stock.

Rolls are stored in racks as per above sketch. Do not allow rolls to touch or any pressure be placed on them.

Do not stock first choice cellophane in piles of more than 10,000 to 15,000 sheets, as pressure has a tendency to cause sheets to stick together. Piles of second choice could be stacked higher but a cardboard separator should be placed at the end of each 15,000 sheet pile before more is added.

Stock no embossed cellophane, as the embossing pattern under pressure will leave the stock. Particular care should be exercised in handling embossed sheets. They are brittle, will split easily at the edges, crack if creased sharply, and for these reasons should be handled as little as possible and shipped as soon after embossing as is convenient.

Stock no black cellophane unless trade in the United States so demands. In France it is used only for millinery and it has been found desirable to make as required.

Stock on rolls 50,000 meters each of standard quick moving colors, such as green and red for confections, yellow for macaroni, pink and sky-blue for perfumes. Cut as desired. This stock serves

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a dual purpose, as it might readily be embossed and supply an urgent request from this field. Only stock in sheet form 2000 sheets of these colors.

Never stock pharmaceutical film. Make it as ordered and always roll and ship immediately in peices of no greater length than 9 ft. with paraffine paper between layers. This film is high in glycerine and unless handled as specified will cement together solidly.

Should humidity in stock room be too low for a continued period it is apt to cause moisture to leave cellophane and cause excessive breaking of film when handling. It will also cause it to break badly under the cutting knife. A normal humidity, 65 to 70, is the best, and Mr. Brandenberger has at times considered the advisability of controlling the humidity of the stock room. Should the humidity be too high, on the other hand, cellophane will stick. Always protect cut cellophane by covering with paraffine paper if the air is too humid or dusty. Never handle cellophane of any grade any more than is absolutely necessary. Each handling causes additional waste.

Never place unnecessary pressure on cellophane or work on bundles of it, even if properly wrapped. The idea must be given that cellophane is tender and very valuable and must be handled accordingly.

Stock Room Force consists of:

All part time used on various miscellaneous machines at other work.	(1 Salaried man part time (1 man on truck (1 girl (2 men - millinery article storeroom

Cellophane rolls are accurately weighed at the end of the casting machine before being placed in the racks there and a tag giving information as follows is inserted in the end of the cardboard roll.

Date_____

Number_____

Quality_____

Width _____

Length_____

Weight_____

Remarks_____

As soon as this roll is brought to the stock room it is closely weighed before tag is viewed. Then tag is compared with stock room weight. Should there be a discrepancy of moment the roll is again weighed on the scale at the end of the casting machine. Error is thus found.

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CUTTING AND INSPECTION ROOM

CUTTING AND INSPECTION ROOM

The flow of cellophane to the stock room has been described under "Stock Room."

For Cellophane that is to be cut, either in stock size sheets or smaller, the procedure is as follows: A copy of the sales order, covering cut cellophane, is sent to the foreman of the Cutting Room. He places a requisition on the stock room for the cellophane desired by him. The rolls are delivered by the stock room truck to a rack similar to that used in the stock room that is located adjoining three spooling reels as specifically shown and described.

A. Spindle for the roll of Cellophane.

B. A shaft extending the width of machine with crank on either end and having a sprocket H keyed to it which drives to the sprocket I keyed to the main shaft D and is geared in a ratio of 2 to 1. The sprocket H is about 7" dia. and the sprocket I about 14" dia.

F. Is frame for supporting the drum which is made up of 8 expanding arms E. This wheel is about 38" dia.

J. Is table for laying out the sheets.

G. Sheers for cutting into small sheets.

X. Is the place where the operator cuts the film with a large carving knife.

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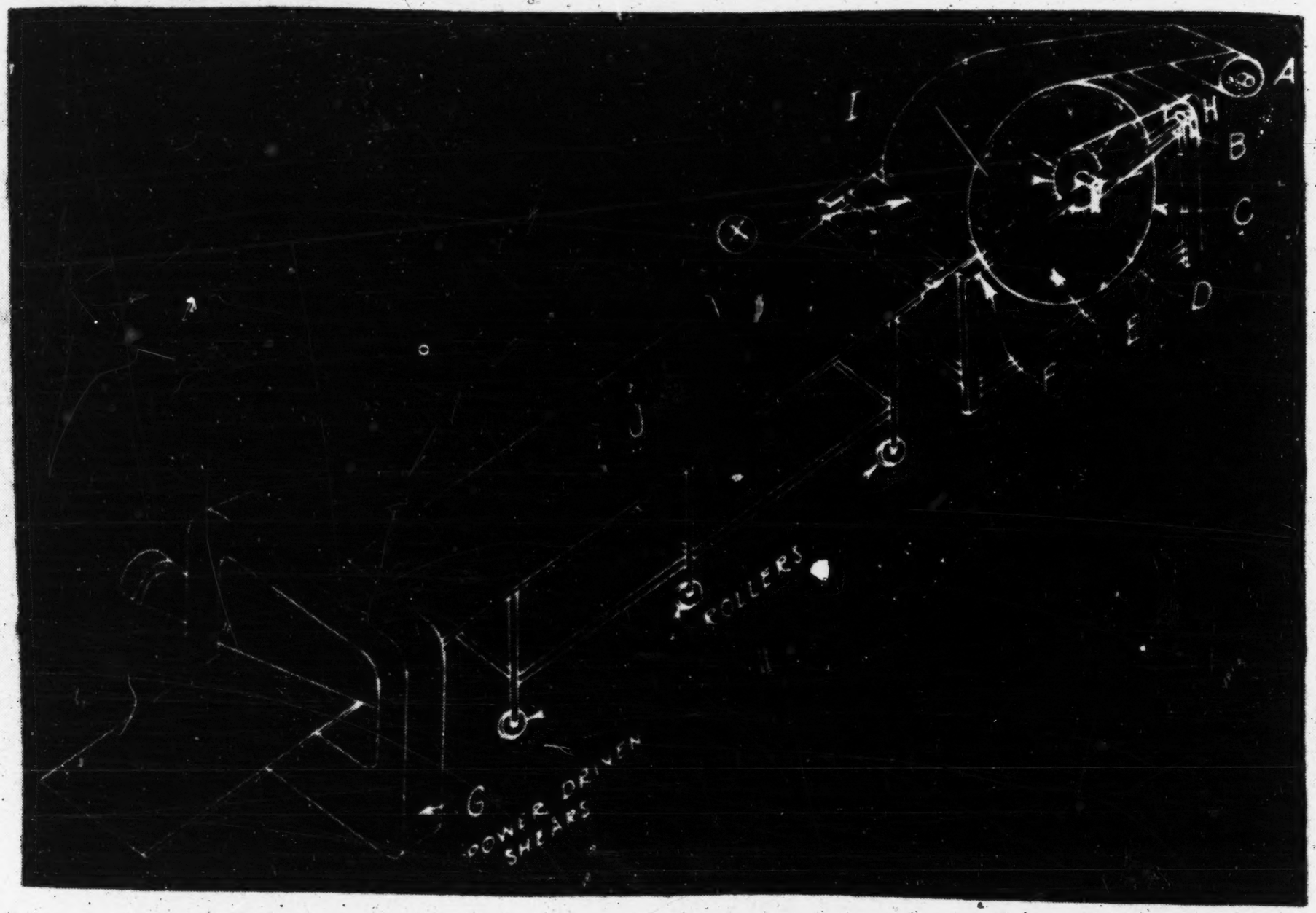
to a rack similar to that used in the stock room that is located adjoining three spooling reels as specifically shown and described.



A. Spindle for the roll of Cellophane.

B. A shaft extending the width of machine with crank on either

Table J. 7 meters long -- 44" wide and height to suit the knives of shear.

Sheets or cutting machines must have very hard cutting edge. Maximum number of sheets cut at one time is 1000. These cutting machines are provided with special gauging device for gauging length of material to be cut so that material can be moved forward proper distance as each cut is made. Like paper cutter.

They load on these large rolls as stated before, about 2000 meters on two rolls of better work film. Form rolls are temporarily held on winding drums by lacing with a few strips of gummed paper. With the three rolls they each take care of 80,000 meters in one day of 8 hours.

They can roll on one drum 30,000 meters in one day of 8 hours if the material is in good condition; otherwise 2,000 meters.

The 2000 meters per roll is based on plain white or colored, but if it is embossed it reduces this capacity to 1,000 meters per drum, due to increased thickness.

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The spooling reels are operated by hand labor - for the three, 5 boys and 1 man are required. A roll of cellophane is taken from the rack and placed on spindle "A". The wheel is rotated by hand, crank being at "H"; and the cellophane is wound around the circumference of the large wheel. The normal circumference of the wheel is 710 cm. but it is arranged so that the rim may be expanded, thus increasing the circumference. The best liked wheel is made of wood; its circumference is split so that when reeling of the cellophane is completed, the cellophane may be cut along the slit circumference with a knife (see photograph).

The wheel has a capacity of

2,000 to 3,000 meters of .02 and .03 mm.
1,000 " " .05 mm.
500 " " .08, .10 and .12 mm.

For embossed cellophane wind only 1,000 meters at a time. In winding from .05 to .12 do not allow thickness on spooling drum to be greater than 2,000 meters of .02 plain white or colored.

Where one reel of cellophane joins another on this drum, the ends are overlapped and stuck together by three strips of adhesive paper.

The rolls of cellophane, wound at one time on a drum, should be selected for width, moisture content and color, so that excessive cutting waste will not result. Should it run uniform in thickness and moisture content, two rolls of 1,000 meters each of .02 mm. are generally wound on the drum. One drum will roll 27,000 meters an 8-hour day of .02 or .03 mm. film if it is in good condition; otherwise, a fair average is 23,000 meters a day.

Care should be taken by the operator of the three drums to reject any cellophane that might be furnished him that is not perfectly dry or that is of a color that must be dyed rather than sold for plain white cellophane.

Before cutting cellophane from the drum it is clamped by an iron bar 1/4 x 1-1/4 x width of drum, one end of which is slotted so that it will pull loose when tension on the cellophane is given.

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The cellophane is next cut and is pulled out on a table shown in sketch. This tabel swings radially from "Krause" cutting sheers and its operation is plain from sketch.

The length of the table is governed by the circumference of the winding drum and by the size stockabout commercially required. The maximum size required in France is 102 cm. long by the width of the film. The table is made long enough to accomodate 7 of these cuts. In France the majority of the stock size sheet sales are made untrimmed; in America at an extra expense of 5% all sheets are squared 100 cm. long by the average width of film comprising the bundle. This table is made of wood, smooth surface, and has iron rollers which roll on concrete floor.

After the cellophane from any one of the three winding drums has been cut and is pulled out on this table, it is examined by Krause press operator to see that it is placed so that the knife of the cutting machine will give square cut. The table is pushed back to its mid position so that the knife will always cut the cellophane squarely. The cellophane is pulled forward under the knife by the length desired and wooden stop is set at this length so one must pull the cellophane forward until it strikes this wooden stop.

The cellophane, after being cut, is stacked in a pile on a movable platform; and from here is carried by the Krause operator or his boy assistant to any one of the cellophane inspection tables. A man and a boy operates the Krause machine and it is ample capacity for the three winding drums as operated in France. Boys used on the winding drums receive 1.5 francs an hour. Krause cutting machine operator 2.5 to 2.9 francs per hour.

INSPECTION

Tables for inspection are 36" high and of sufficient length to carry easily 6 standard 1-meter length sheets of cellophane. (See sketch) (3 x 4)

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Small iron movable guides help keep the Cellophane at even edge.

Inspection work is always done by two girls, each standing as shown by sketch -

and these two girls will count, check and sort between 24 and 25 standard 500-sheet bundles of Cellophane in a day of 8 hours.

Each color of Cellophane is inspected separately and a portion of a table is allotted for this particular grade. The inspection procedure is as follows --

From the Cellophane delivered by the Krause cutter operator, the head girl tosses the corner of 5 sheets at a time. There are but three grades to be looked for -- first choice, second choice and waste. The Waste comprises only the ends that have been glued together by the 3 paper ribbons on the winding drum; second choice only Cellophane that contains gas bubbles, badly torn, improperly washed, or badly wrinkled first choice; balance all goes in first choice. On sheets of other than standard size, these are graded into first and second choice also and are used in the making up of first and second choice small cuts.

Each inspectress with her assistant's help, places the inspected Cellophane in its proper pile, and, after sufficient quantity is inspected, head inspectress starts counting the sheets from one corner of the pile while her assistant counts from the diagonally opposite corner. As each hundred sheets are counted by the two girls, they pass their hands through the Cellophane, and, if their fingers touch, they know their counting checks. If their fingers do not meet, they recount. A small cardboard strip, 1" x 4", is placed at the end of each 100-sheet count. When 500 sheets have been counted and checked as above, the head inspectress places a sheet of paper, 1" x 5", into the Cellophane which contains her number. The 500 sheets are lifted on a piece of standard-size cardboard (see sample) and are carried by the inspectress and her assistant to a table at the end of the inspection tables. Here the operators of the cutting machines draw for their cutting work and the wrappers of standard-size sheets also secure their supply. 5 girls and 5 assistants at Bessens, working an 8-hour day, handle on an average of 62,000 sheets. One girl, not an inspectress, checks at random the counted piles of 500 sheets of Cellophane. This is but to check up on the inspectresses and see that their count and quality is correct.

The amount of second choice and waste from the inspection operation averages 1% waste that is fit for nothing but shredding for packing; 10% second choice.

The waste from inspection goes first to the smoothing room described on Page before being definitely rejected for cutting up into packing.

The cellophane is next cut and is pulled out on a table shown in sketch. This tabel swings radially from "Krause" cutting shear; and its operation is plain from sketch.

The length of the table is governed by the circumference of the winding drum and by the size stocksheet commercially required. The maximum size required in France is 102 sm. long by the width of the film. The table is made long enough to accomodate 7 of these cuts. In France the majority of the steak size sheet sales are made untrimmed; in America at an extra expense of 5% all sheets are squared 100 cm. long by the average width of film comprising the bundle. This table is made of wood, smooth surface, and has iron rollers which roll on concrete floor.

After the cellophane from any one of the three winding drums has been cut and is pulled out on this table, it is examined by Krause press operator to see that it is placed so that the knife of the cutting machine will give square cut. The table is pushed back to its mid position [illegible] the knife will always cut the cells

The head inspection girls are paid from 1.5 francs to 1.7 francs per hour -- these girls are picked from the entire force and receive the highest rate. The average starting rate for girls is 70 centimes per hour and for women 1.10 francs. Girls who inspect receive 1.50 - 1.70 francs per hour and work eight hours.

CUTTING

For the cutting to non-standard sizes, the following cutting machines are in use at Bezons. All are used for either trimming standard sheets or cutting to smaller sizes :

No.	Name	Manufactured By	Capacity sheets	Capacity width
1	Krause	R.Krause, Leipsig, Germany	1000	100 cm.
2	Jurine	Ets.Jurine, 12-16 Rue de Cite, Lyon-Villeurbonne, France.	"	"
1	E.Vriand	A.& G.Shermile, Successors, 208 Faubourg St.Martin, Paris, France.	"	"
1	Augusta #5871	No name plate (old machine)		
1	J.P.Fournol	J.P.Fournol, 10 Boulevard Jodles Perry, Paris, France.	1000	
1	Toulouse #679	C.Decreuse, Paris, France.	"	"

In addition to these, the following die presses are used for cutting disks, date tops, envelopes and specialties :

2 Bobst presses, manufactured by Bobst Cie, Lausanne, Switzerland.

2 Waste machines, 102 mm and 104 mm are used for cutting up scrap cellophane into packing.

1 Candy Webbing machine, hand driven, is used for slitting the end of individual sheets of cellophane that are used in wrapping individual confections.

The details of the operation of the better of the above machines will be described :

Cutting Machines :

Jurine Guillotine Shear, manufactured by E.P.Jurine, Construction Mecaniques, Societe Anonyme, 12-16 Rue de Cite, Lyon-Villeurbonne, France, is considered the best cutting machine. Its capacity is 100 cm and handles 1000 sheets of .02 mm plain white at one stroke. The machine can be equipped with an advancement mechanism which enables a number of cuts of one type to be used with minimum effort on the part of the machine operator.

Weight - 2200 kg.
Charge - 16,000 francs, f.o.b. manufactured point.
Capacity - 60,000 separate size sheets per 8 hours, trimmed 4 ways.
Cycle of knife - 10 seconds.
Pressure given by foot only and varied by cast-iron weight - different thicknesses of cellophane require different pressure.

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Embossed cellophane should never be cut in piles of more than 500 sheets and only a holding pressure used.

Jurine machine requires 2-1/2 horsepower motor.

Clean cutter once a day and oil each morning with light oil. Wipe blade edge every hour with a block of paraffin or a non-acid soap.

On small cut work, cut on a quarter inch cardboard as per sample and adjust knife so that cardboard is but slightly cut at end of knife stroke. Keep shifting board so that a chase is not formed under the blade. Should this happen, the bottom sheets of cellophane under the blade will be torn.

Keep an extra pair of spring coils for Jurine machine, one for blade stop and one for starting levers. Blade steel is made of the best French steel "Acier Peugeot." Manufacturers will not give analysis of it. Sheffield, England, has produced steel blades for these French machines that require sharpening but once very two weeks.

Krause machine cuts between 150 and 500 sheets of .02 mm. at a stroke and can cut 1,000 sheets of .02 mm. plain white. Krause will cut 80,000 meters of .02 mm. in 8 hours.

Bobst press will cut 300,000 special sizes in 8 hours.

A German machine for winding cellophane and cutting into standard sheets in one operation has been installed at la Cellophane but has been found to be impractical inasmuch as it tears the cellophane in the operation.

The above cutting machines will cut the same number of sheets of .02 mm. silk and taffeta as .02 mm. plain white. Linen and moiree can be handled in only one-half the number of sheets because of the thickness of the film. Always allow 1 mm. over size on silk cuts as the film shrinks.

A small hand-cutter, consisting of circular galvanized iron plates of the size desired and a Gillette blade cutting tool, as shown in sketch, is used for cutting 4,000 to 5,000 sheet orders or disks too large for dies. This machine will cut 20 sheets of .02 plain white or colored at one time.

CUTTING AND INSPECTION

The foreman of the cutting room delivers to each cutting machine operator the size he desires him to cut; and this operator secures his own stock from the piles passed by the inspectresses and cuts it to suit his own ideas. Should there be strips of the cellophane left over after

an order is cut, these are stored on tables and are used later for other orders.

Boys of 16 or 17 years of age handle the cutting machines.

Printed labels are cut in stacks which have been margined by the printer and stacked on wire needles. Here very close cutting work is necessary and the cutting machine operators for this class of work receive 3 to 3½ francs per hour, whereas the cutters for standard sheets only receive 2.50 to 2.80 francs per hour.

The cutter, after completing his order, places the cut stock on a 4-wheel platform table and this is shoved to the wrapping table where it is wrapped and marked before shipment.

Where standard sheets are trimmed for American trade, each cutter has a helper who helps to place the 1000 sheets to be trimmed on the table and to remove them after trimming to a stock pile at the end of the wrapping table. Only such stock is cut as is to be shipped promptly - no sizes other than on order are stocked. This statement applies to disks, sacks and specialties, as well as to standard sheets.

All cellophane when being cut 500 to a stack, has a thin piece of cardboard top and bottom. In 1,000 stacks the same cardboard appears top, bottom and middle.

W R A P P I N G

STANDARD SIZE SHEETS

All standard stock size sheet shipments contain:

.02 and .03 mm.	grade	-	500	sheets	cellophane	-	weight about	15 kg.
.05	"	"	-	250	"	"	-	17½ "
.08 " .10	"	"	-	100	"	"	-	16½ "
.12	"	"	-	50	"	"	-	15 "

The wrapping of standard and non-standard sheets is done by 4 girls, one of whom does strictly clerical work. Wrapping table is as per sketch.

The operation consists in pulling out on the table its full length 120 cm. wrapping paper as per sample. This is cut between the three piles, being arranged so that each girl has sufficient paper for her particular bundle. Next a sheet of paraffine paper is laid on the wrapping paper, then the cellophane as it comes from the cutting machine. This is topped with para-

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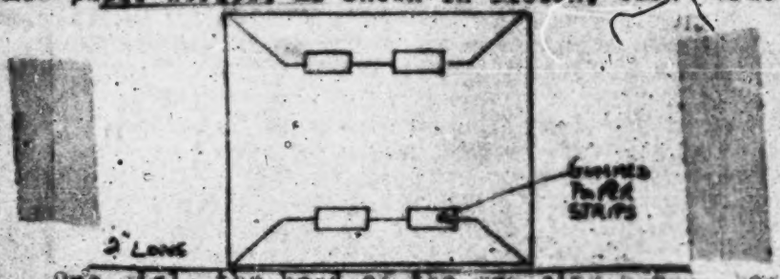
ffine paper again and a piece of cardboard similar to that used on the cutting machine. The wrapping paper is then folded from the bottom and glued at the ends, as per sketch, with gum arabic glue.

An 11 lb. bucket of gum arabic, softened in warm water, makes up 14 qts. of glue; and this lasts the wrapping room one month.

Small bundles, namely, sheets other than standard, instead of being glued on the ends with gum arabic, are fastened by two gummed paper strips, as shown in sketch, each about 2 inches long.



One girl, the head of the wrapping table, besides handling her normal wrapping work, measures all bundles before they are wrapped and calls the width to the girl in the squad who does the clerical work. She prepares a label for each package, the same containing the following information: (See sample.)

Quality
Color
Width
Quantity
Size

A shipping label is also added, this having been addressed from the order by the same girl who makes up the size labels. Order number appears on the shipping label in addition to the address, as well as material included in the package.

When an order is completed, wrapped and tagged, the shipping room copy of it is marked, showing what has been shipped; and, if the order is completed, it is so marked with the date of completion.

The shipping department calls for the sheets to be shipped at the end of the wrapping table. The truck which transports bundles hauls 23-500-sheet bundles and has a flat wide wrapping table which does not bend the sheets during transportation.

Only the dryest cardboard should be used for wrapping cellophane.

Girls used in wrapping cellophane receive 1.50-1.70 francs per hour.

S H I P P I N G

Shipping

As soon as a truck load of wrapped cellophane arrives in

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the shipping room, it is checked against the order shown on each package of cellophane and the quantities in the package are marked on the order as being shipped. A detail of the orders shipped each day is copied from them to a stock record and this shows completely how each parcel of an order was shipped, the quantity, and when shipped.

For export work, 23 bundles, each containing 500 stock sheets, are packed in one wooden box, weighing 80 kg., 104 cm. x 26 cm. The next size box for export contains 15 bundles, each of which contain 500 stock sheets. This box weighs 40 kg. and is 104 cm. x 104 cm. x 113 cm.

The wrapping done by the shipping department, in addition to that already done by the wrapping room, depends entirely where the cellophane is being shipped to:

I. Paris and suburbs -- Delivered by motor truck from plant. The package from the wrapping table in the cutting room, containing address label pasted thereon, is delivered to customer without additional wrapper.

II. Express shipment -- These are delivered by motor from Bezons to the express station in Paris. Wrap package as it leaves wrapping table in cutting room with corrugated board and brown wrapping paper per sample. Label.

III. Parcel Post via mail

1. France, Switzerland, Belgium and nearby countries -- Pack same as express.

2. Austria, Germany, Sweden -- Wrap III-1. with nonreinforced waterproof black paper, then with corrugated board, then sew in burlap; paste and sew label on.

IV. Case packing

1. For export over water -- Line box with black reinforced waterproof paper with ample laps, and place cellophane as it leaves wrapping table in cutting room.

2. For overland shipments -- Use black nonreinforced waterproof paper for lining box unless distance is great and moist sections traversed. If such be the case use reinforced waterproof black paper. Place packages, as received from wrapping table in cutting room, in this case.

V. Roll Shipments

If any shipments are made of cellophane in roll form, follow the above specifications. Support cellophane on cardboard roll at ends - do not allow roll to touch package. Wrap in paraffine paper.

Black wrapping paper, reinforced and waterproof, costs 1.85 centimes per meter length. It is 130 cm.wide.

Wrapping done in the shipping room is fastened by cord.

The truck, hauling sheets from wrapping table in cutting room, has a platform 53 x 43 x 23 and is the same height as the wrapping table.

The Shipping organization at Bezons consists of:

1- Salaried man who transmits orders and supervises department
1- Ass't. (Salary) who checks and records

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small shipments as they come from wrapping table

1 - Girl stock record clerk 1.5-1.7 francs per hour.

4 - Carpenters, packers,-who do the actual boxing and handling - rate 3.25 francs per hour. These men generally work 10 hours.

D Y E I N G

&

G L U E I N G

E M B O S S I N G

DYEING

DYEING CYCLE.

At the end of the casting machine there is wound on cardboard rolls, film that is torn, due to breaks in the casting machine. A piece of white paper, 1-1/2 x 6, is inserted in the end of the roll at the end of each tear and this roll passes directly to the dyeing room where it is put on a vaporizing machine for mending. While the torn ends are being glued together, as will hereafter be explained, the number of meters of finished glued roll is also ascertained; and, when the roll leaves the vaporizing machine, a tag similar to that used in the casting machine is placed in the end of the roll. It is then passed to the stock room and is generally immediately sent back to the dyeing room for dyeing.

All rolls run on the casting machine strictly for dyeing purposes contain 1,000 meters.

The mending of a roll of torn cellophane does not prevent it from being embossed.

DYEING ROOM CONSTRUCTION.

See exhibit U . Size of dyeing room is shown on exhibit.

Brick building, concrete floor, skylights in roof, roof tile on wooden purlins, plastered under purlins. No humidification, steam heat. Vapor-proof globes. Floor drains at each dyeing machine. Surface and discharge piping to and from machines can be of SB pipe.

All film passing into this room has had a preliminary drying treatment. It is tougher and has none of the objectionable chemical factors that sometimes cause trouble when the film is being made.

DYEING OPERATIONS.

Film for the dyeing room is of three kinds:

1. Colored bleached stock, made on the casting machine, that was primarily intended for sale as plain white cellophane. The dark or spotty color when made prevents it from being so used and it is dyed and disposed of as first-class stock after dyeing.

2. Film from the casting machine that has passed through no bleach bath and in which reconcentrated glycerine is used in #14 casting machine tank. Unbleached rolls handle as easily as bleached and are slightly cheaper to make. Not passing the cellophane through the bleach bath tends to cause a variation in the shade of unbleached film and it is the opinion at Bezons

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that it is advisable to bleach the film for coloring as you secure a more uniform finished product. It is not advisable to use unbleached film for wrapping.

3. Film that leaves the casting machine with heavy stripes or uneven spots in it. This is frequently dyed and passed through the glueing machine, where, on the last rolls, an automatic cutter removes the objectionable heavy stripes. This is particularly done if the stripes are near the end.

DYEING ROOM CAPACITY.

At present about 15% of the entire output of four (4) casting machines passes through the dyeing room. For the European trade alone, that is, not counting the American, 30% of the cellophane produced in Europe is of the dyed class. America uses but little dyed material so far but this is because no effort has been made to sell it. During 1922 only 100,000 standard sheets of colored cellophane were used, whereas Bezons produced 5,900,000.

Between 7% and 8% of the plant output of colored cellophane is of embossed kind. America so far used but little for the same reason as expressed above.

DYEING MACHINES, ETC.

Film may be dyed in any one of four machines. Each will be described in turn.

1. Should a large order, 70,000 meters and up, be received for colored cellophane, it is generally dyed as it is made on the casting machine. Dye is placed in second wash tank before the HCl tanks. Pure glycerine is used in casting machines bath in this case. The film is not bleached or given HCl bath treatment. Dyeing by this method is not now considered as economical as (2) as it requires more dye and there is always 2 days time lost in thoroughly cleaning the casting machine, after a run. Dark unbleached cellophane for dyeing is frequently due to poor ventilation in dryer of casting machine. Pharmaceutical and gutta percha film are frequently dyed in casting machine. See Page ( ) for detailed description.

2. Film cast specially for dark color dyeing in the main casting machine is treated with reconcentrated glycerine in tank 14; does not receive the bleach bath treatment but is given the regular desulphuring bath and HCl bath. Regular film that has had all treatments but which has been delivered at the dryer end with bad color, is also used. Rolls should contain 1,000 meters although shorter rolls are used.

3. Films leaving casting machine for dyeing are recorded in stock room and are immediately returned to dye room for dyeing.

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Rolls are divided according to thickness, moisture content, number of breaks, and are assigned to one of the machines that will best suit their particular condition.

Dark dyeing machine: see photograph
Sketch of this machine has been given [illegible] Hope. One in use at Sarphs.

(a) Film when dyed passes through first water at 40° C, in 6 ft. long x 8" deep trough in front of dye bath. Hot water causes cellophane to take dye better. Should film be of high moisture content, it is frequently passed directly to dye bath with at this preliminary soaking.

(b) Film next passes between squeeze rolls. These remove excess water.

(c) Film enters dye bath that is kept at 100° C.

(d) Film passes through squeeze rolls, to

(e) Wash tank where water at room temperature 50 liters per minute or more removes excess color. Steam is supplied to the tank through open [illegible] but it is never used. Would be used in America.

(f) A pipe water spray sprays both sides of the film thoroughly just before it passes to

(g) Squeeze rolls

(h) Then through glycerine tank. Concentration for 15 - 16% glycerine content being:

.02 mm film	-	1.030 sp. gr.
.03 " "		1.035 " "
.05 " "		1.040 " "

(i) Then through squeeze rolls to

(j) Dryer and wind up similar to the ones of the casting machine.

Rolls for dyeing machine.

Dye bath has 6 top and bottom rolls
Cold water bath 9 top and bottom rolls.
Glycerine 3 " " " "
Copper aprons between tanks are best.

All wet end of machine process rolls are copper cylinders, cast iron ends, steel journals and cast iron bearings, except squeeze rolls which are the same as in the casting machine. The lower rolls immerse in the of machine travel in steel strap bearings that in turn are bolted to a channel on either side of this channel rests in bottom of unlined wooden tank. Make all rolls so they do not leak. Dryer rolls are same as rolls of casting machine, that is, lead 80%, antimony 20% bottom and hard rubber top. Copper is considered very satisfactory for either or both.

Dryer bottom rolls are heated with hot water 60 -70° C. same as casting machine. Each dryer has its own hot water heater and circulating pump.

Dryer has 16 bottom rolls and 15 top.

In addition to hot water heat to bottom rolls, Bezona Plant supplies heated air from fan from underneath bottom rolls only. It is the opinion that this fan can be discontinued and that water heated rolls are sufficient. Air is supplied at same temperature as in casting machine. Drive same as casting machine only at dryer end.

Dark dyeing machine speed. 12 - 15 meters per minute. This depends on the thickness of the film and the shade of color desired. Dryer speed is same 12 - 15 meters per minute. Temperature of water is 60 -65° C.

Depth of Bath - 80 cm.

Capacity of Machine. - For .02 or .03 mm. dark color film - 6 - 8000 meters per 6 hrs. Machine requires one foreman (rate 3.25 to 3.5 francs per hr.) and 3 operators (rate 2-3/4 to 3 francs per hr.) to operate.

CONCENTRATION OF DYE.

LIGHT DYEING MACHINE.

Dye Bath Compositions in Use.

Color	Gms. per Liter	Dye
Red	1.5	Mixture of 9 pts. Benzol Red. F.C. and 5 pts. Brown A.T.C. by weight.
Pink	0.15	Geranine G.
Green	1.0	Mixture of 4 pts. Cerkel Blue and 3 pts. Yellow C.H. (Basle).
Nile Green	0.5	Same mixture as for "Green"

Color	Gms. per Liter	Dye
Violet	0.4	Mixture of 1 pt. Benzo Violet and 1 pt. Violet Oxydiamine B4F.
Mauve	0.15	Same mixture as for "Violet"
Yellow	1.0	Yellow C. H. (Basle).
Cream	0.15	Yellow C. H. (Basle)
Blue	1.5	Mixture of 1 pt. Corkel Blue and 1 pt. Greenish Blue (Basle)
Sky Blue	0.5	Same mixture as for "Blue"
Orange Yellow	1.2	Mixture of 2 pts. Yellow C.H. (Basle) and 1 pt. Brown B.T.C.
Chocolate	0.5	Mixture of 3 pts. Brown Oxamine, 3 pts. Direct Black, 1 pt. Yellow C. H.

500 gms. of Na_2CO_3 are added to the first charge to soften the water. No further addition is made. No salt is used.

DYE CONSUMPTION.

1 to 2% of wt. of Cellophane for dark shades.
0.5 to 1 of wt. of Cellophane for medium shades.
0.1 " 0.5 " " " " " light "

Waste: Film waste in this machine runs as high as 8%. Will average 4 - 5%. The machine above described is best used for making dark colors. Light colors may be made in it but they can be more economically made as hereafter described.

Use only pure glycerine in the glycerine bath of this machine.

See that rolls contain no liquid from previous bath. When necessary, as can be told by $Cu\ CO_3$ deposit on them, wash tank rolls with HCl as in casting machine, then with water; dress with emery cloth; wash tanks if necessary with dilute Na_2CO_3 or NaOH solution. When the color of film to be run is to be changed, it is better to make a change from light to darker color about end of run so machine can be thoroughly washed with hot water, plenty of it and scrub brushes before being used again in another dye.

The difference in color of dyed cellophane where same dye bath specifications have been followed is due to the difference in color of the unbleached film. It is considered advisable to use bleached film for dyeing - uniform color is necessary as it gives more uniform results. Reconcentrated glycerine can be used in film for this machine. Machine has brakes on both wind up and unwind shafts.

BLACK DYEING MACHINE.

One is in use periodically at Bezons.

Due to the difficulty in washing black dye from a machine

and because it requires special washing, a special machine is used only for this dye. The machine is similar to the dark dyeing machine above except that it has more dye tank and double wash tanks.

Place pipe cold water spray top and bottom of film before it enters cold water bath.

ROLLS:

Dye Bath has 9 top and bottom rolls

Tepid Water Wash-Tank - 14 top and bottom rolls

Cold Water " " - 5 " " " " "

Glycerine - 3 " " " "

Film is handled as described under "Dark Dyeing Machine" and flow is similar except tepid water bath precedes the cold water. Squeez e rolls between each tank; same composition as casting machine. No squeeze rolls at entrance of dye tank.

All rolls for bath are of iron shell, iron ends, steel journals and bearings. Bottom rolls rest in channel beam on bottom of tank and have steel journals and cast iron bearings.

Dryer has same number and kind of rolls as dark dyeing machine only lower rolls have no hot water heat. This is thought desirable, but has never been installed; Mr. Brandenberger strongly recommends. Dryer is heated by hot-air from two fans - one top and one bottom. Both are motor driven and deliver air along the dryer at 80-85° C. similarly as fans of casting machine.

Speed of film: 10-15 m/minute s - 12m/minutes is about right for .02 mm film.

DYE:

Sulphur colors have been used heretofore. This requires very careful and thorough washing in circulating water. Sulphur Black has not always been satisfactory as it sometimes "blooms" with age. Direct black dyes are thought to be better. No formula available. This machine is used only for millinery and the demand is quite variable.

SULPHUR BLACK DYE BATH:

Dye Tank Charge: - - - 1100 liters
11.0 Kg. -"Katiguene G" Black
5.5 Kg. - Fused Na_2S
2.0 Kg. - Na_2CO_3

To maintain bath concentration - add solution

6.0 Kg. Katiguene G
3.0 Kg. Na_2S
100 liters boiling water

Dye bath is kept at 100° C. and is used for .02mm, .03 mm. and .05 mm. film.

SPEED OF MACHINE:

5 - 12m/mm. Twelve meters per minute is good for .92 mm. whereas 5 - 6 meters per minute is best for .05 mm. Film remains in dye bath 4 - 5 minutes.

Consumption of Sulphur Black - 70 grams dye per 1000 g. film.

CARE OF MACHINE:

Keep clean as for dark coloring machine.

PRODUCTION OF MACHINE:

Six - 7000 m/ 8 hours depends on wind and color of film run. Drive same as coating machine. Locate color at dryer end.

Machine requires three (3) operators (rate 2.5-3 fr. per hour) and a foreman (3½-3.5 fr. per hour) to operate.

REMARKS:

Machine has brakes at wind-up and unwind shafts.

Sulphur colors are more trouble to dye than direct but are cheaper and, if properly washed, give an excellent product.

Reconcentrated glycerine can be used in film for this machine.

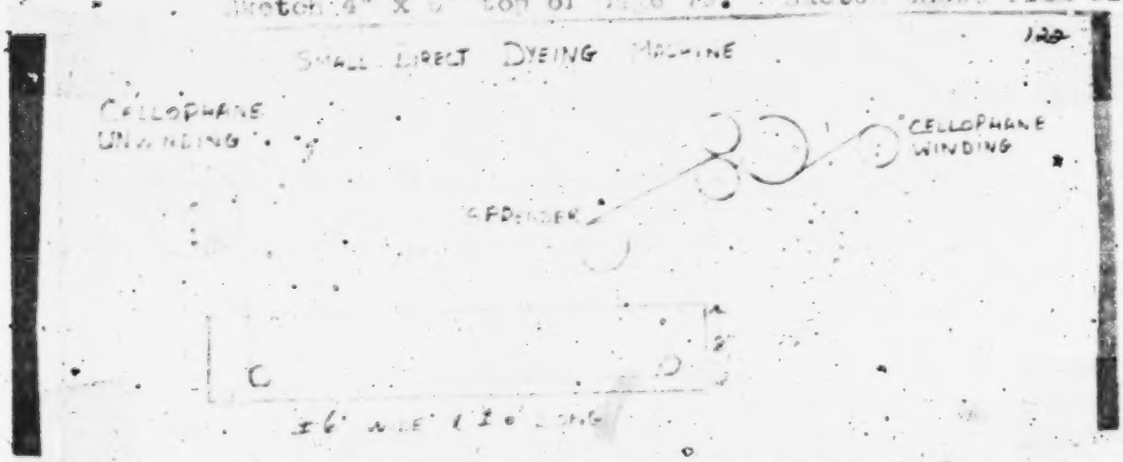
SMALL DYEING MACHINE:

See photograph.

Machine is very simple. Drawings given after [illegible].

Two machines in use at Dezons.

Sketch 4" x 6" top of page 70. Sketch shows film flow.



Dye is added directly to tank, 6' x 6' x 8" and steam supplied here keeps bath at proper temperature. Machine requires but one man - rate 2.5-3 fr. per hour to operate. Speed is variable and runs from 3-12 m/mm. Machine has no dryer attached.

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used principally:-

1. For dyeing light colors, short or standard rolls of .02 and .03 mm film that has not been made of reconcentrated glycerine. A considerable saving can be made by so doing, standard procedure is:- Pass Cellophane through 45-50 degrees Centigrade bath in 6' x 6' x 8" vat at rate of 10-12 m/m for .02 and .03 mm. This bath contains the direct dye in quantity de red and 14 percent glycerine density 1.025 - 1.028 at the start up only. Glycerine released from film while in bath, keep glycerine contents of bath constant after starting up. The saving in glycerine over dyeing in dark dyeing machine will equal 125 kg. glycerine per 8 hour day.
Film, after being dyed as above, goes to dryer direct and is dyed at 10-12 m/m in temperature that will be described hereafter.

2. For dyeing light or dark colors .05 mm, standard or short rolls of Cellophane that have or have not been made from reconcentrated glycerine. The process is here the same except that film after being dyed is wound up in the machine wet and the roll is passed to the one end of the washing machine, to be described later, where it is thoroughly washed. It is then passed to the receiving end of the drying and gluing machine where glycerine is placed back in film machine. Glycerine strength in vat bath is kept up by addition from pail. The film then enters dryer and is dried. For some purposes it is not necessary to place all glycerine back in film as the articles made out of Cellophane will require no flexibility. It is better to count on bringing glycerine back to normal strength so film will not crack and tear in handling, This machine is necessary in films of .05 mm or mms as it allows the extra long washing after dyeing to be given. See write-up of "Drying and Gluing Machine."

3. Machine may be used for wetting rolls of Cellophane that are to be glued together to make a thicker product. Here 40 degrees Centigrade water is used in vat bath at front end of machine and speed regulated so that film being used is thoroughly soaked with water.

ROLLS:-

Rolls in bath are of copper with cast iron end and bearings and steel journal.

Spreader rolls are of wood with cast iron ends, journals and bearings.

Squeeze rolls are standard except the lower end if pitted is frequently covered with cloth.

Roll before windup is of hard rubber with calico covering.

Windup and unwind have brakes and machine is belt-driven from jackshaft.

SUMMARY OF DYEING:-

Capacity of dyeing room at Bezons is considered 15,000 meters hours. All of the colored Cellophane and all rolls of broken pieces are passed through this room. All Cellophane above .06 mm thickness is piled up here on gluing machine.
.02 and .03 mm are dyed in the dark dyeing machine when dark shades are desired on either the dyeing and gluing machine or light dyeing machine when not made from reconcentrated glycerine and light shades are desired.
.04 - .06 mm are always dyed in light color dyeing machine.

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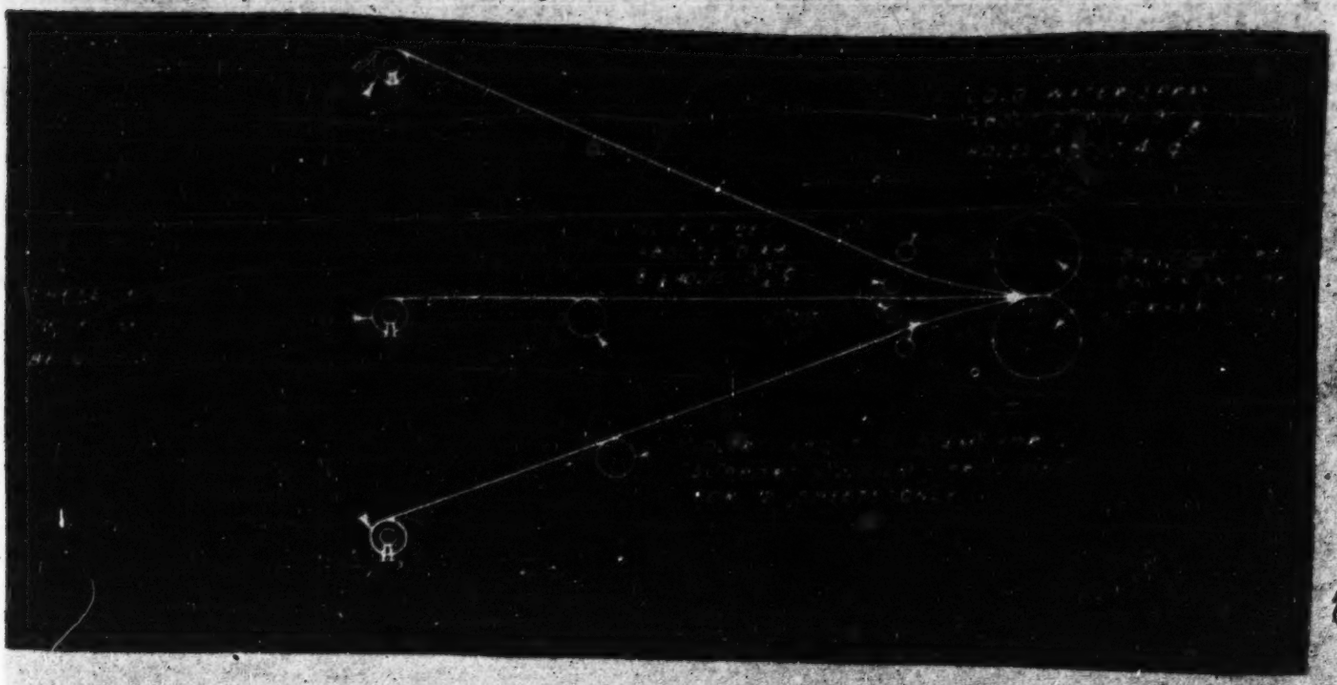
GLUEING & DYEING MACHINE

See Sketch and photograph. Sketch 4"



This machine is constructed similarly to the dryer of the casting machine. Dryer has 37 Top Rolls and 48 bottom. Rolls should be of copper. A fan top and one at bottom supply hot air for drying and temperature is kept 45°-50°C. Speed of machine runs 10-12 m per minute. One machine used at Bexons for the following purposes.

1. As a dyeing machine for light color roll of .02 or .03mm film that has not been made of reconcentrated glycerine. Operation is same as in machine just described and glycerine saving is as much.

2. Impregnating special films or films .06 mm thick or thicker with glycerine. The glycering is added continuously to the 6' x 6' x 8" vat in front of the machine. Bath density (0.04 mm = 1.040 Sp.Gr.
(0.06 mm = 1.045 " "

3. Drying film that is too wet. Here the machine is used just the same as a casting machine dryer.

4. For glueing two or three sheets of cellophane together. Always have rolls of cellophane thoroughly soaked before glueing.

For quality - thickness use

1200	.08	2 sheets .04 mm
1500	.10	1 sheet .04 - 1 sheet .06
1800	.12	3 sheets .04
2000	.14	2 sheets .04 - 1 sheet .06 mm

Glue supply pipes shown in sketch have 1/8" holes drilled in them as noted and glue is supplied through these as desired from a tube that is located on top of the machine. If glue flows too fast plug some of the holes with wood.

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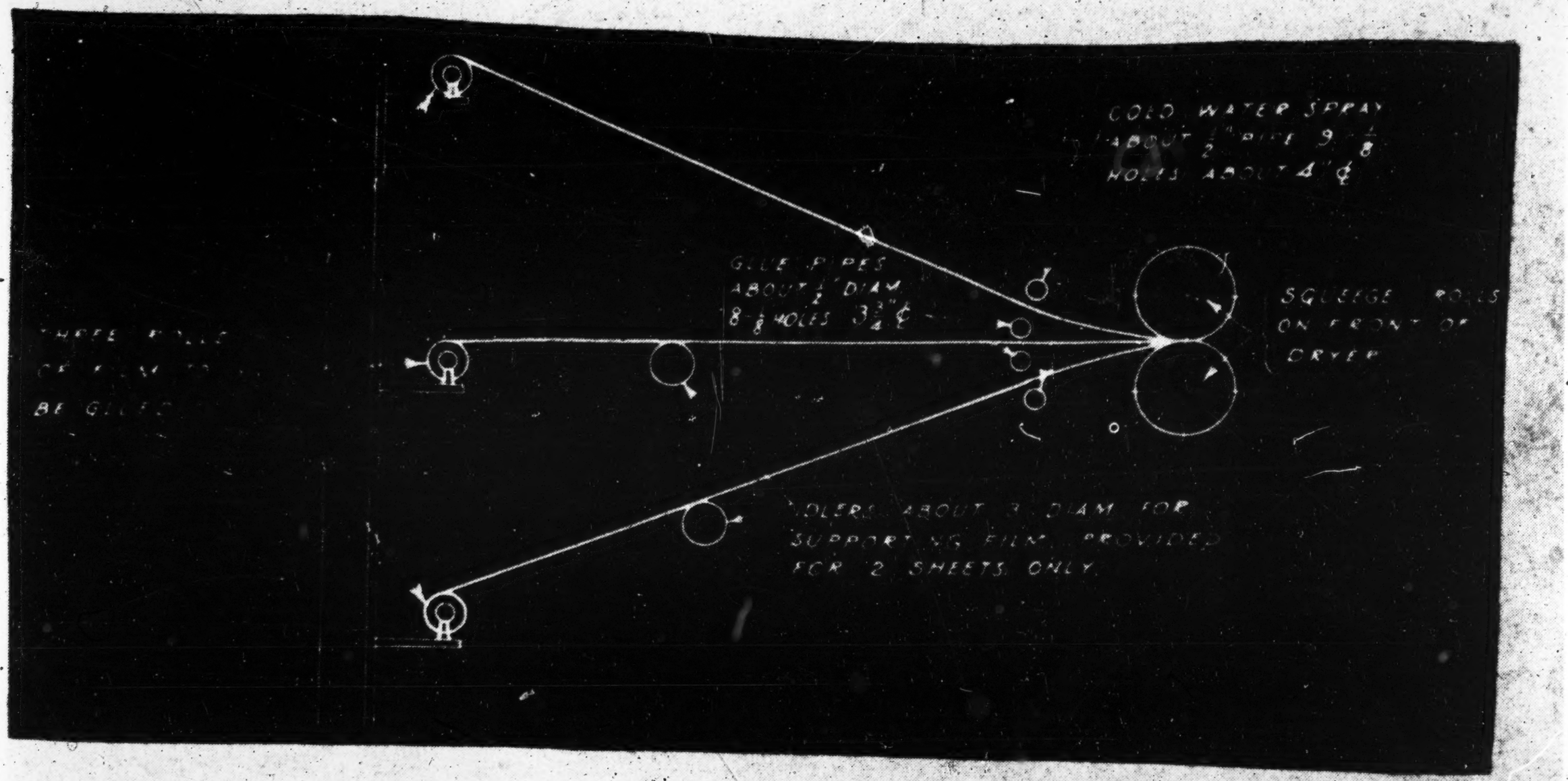
GLUEING & DYEING MACHINE

See Sketch and photograph. Sketch 4"



This machine is constructed similarly to the dryer of the casting machine. Dryer has 37 Top Rolls and 42 bottom. Rolls should be of copper. A fan top and one at bottom supply hot air for drying and temperature is kept 45°-50°C. Speed of machine runs 10-12 m per minute. One machine used at Bexons for the following purposes.

GLUEING & DYEING Cont'd

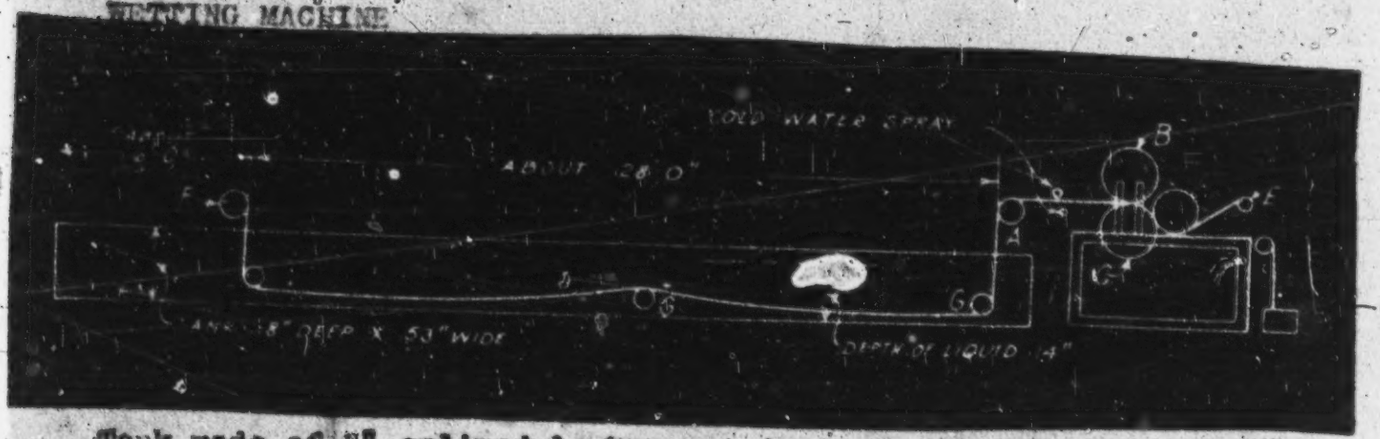
Glue used for plying up sheets is

Gelatine 7 gm
glycerine 7 gm
water enough to make 100 cc.

Process is clearly described by sketch.
Just add sufficient glue to film so that none wastes at edges. Keep cold water spray pipes clear as they, by washing, keep any glue from the outside of the film.
Always make up Cellophane above 106 mm thick as above as to attempt to make this in ammonium sulphate bath will result in great trouble and waste.
Before film leaves the dry end of this machine, it passes under a tool which rests on a top roll of the machine and by which uneven edges and heavy stipes may be cut from the roll. The cut strip or strips are wound in flys under the machine. This is frequently done when preparing a roll of film for the embossing rolls.

One foreman (rate 3½ - 3.5 fr. per hour) and three operators (rate 2.3- 3 fr. per hour) operate this machine. Foreman can be engaged in other work also.

WETTING MACHINE



Tank made of 3" splined lumber set in lard, bolted securely at ends and along bottom by through bolts bearing on a ¼" x 2½" iron strap. Walter Hope has sketch. Exposed rods are covered by lead sleeves.
Windup on machine is braked and revolves at 22pm.
Water consumption is 10 liters per minute and overflow 1" ø s.b. pipe. Tank is provided with bottom cleanout, and water completely changed when it is dirty or once a week.
Water kept at 30 degrees to 40 degrees Cent.
Film in traversing length of tank will expand from 90 cm. width to 100 cm.
During travel of film it will average 10% expansion and all glycerine is extracted.
Roll provided for 3-4 meters travel is for the films which are not strong enough to traverse full 10 meter length.

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CASTING MACHINE Cont'd

Casting machine is used for

(1) To wet thoroughly film used in gluing operation

(2) To wet film used for moving picture work.

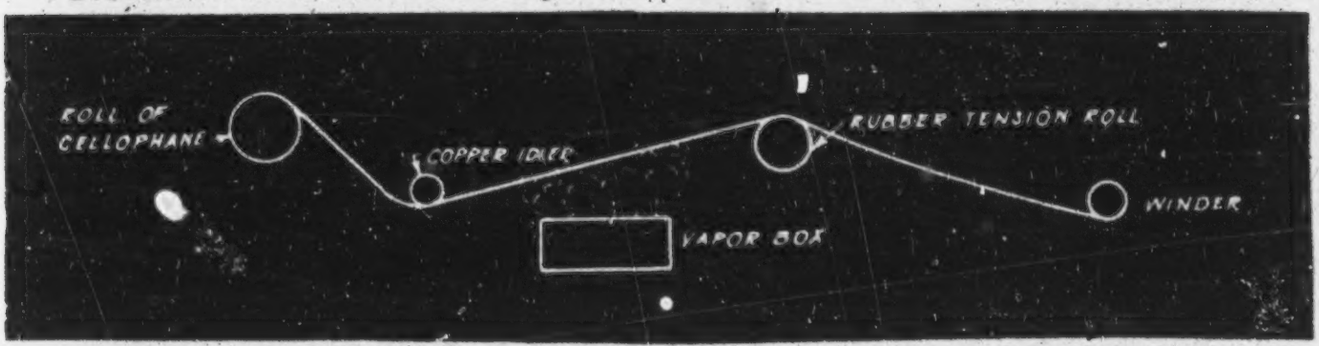
(3) Washing film above .5 that have been dyed in light dyeing machines

(4) For remasking films from the casting machine that have not been sufficiently washed and contain acid or sodium sulphate.

The same operator who operates the light dyeing machine operates this machine and is built exactly like light dyeing machine while it is unwinding, the cellophane is being straightened out so that it can be passed under knife or used for other purposes. 1 operator per machine rate 2.7 - 3.0 ft. per hour.

VAPORIZING MACHINE

Five are installed but only four are used at Nezona. See sketch 2"



Rolls of film that contain broken pieces are marked at the casting machine by placing strips of white paper 1/2" x 6" in the end. These rolls are passed directly through storeroom to the vaporizing machines where they are mended. Where a break occurs in a roll the cellophane is cut completely across and is wet with Zn Cl2 solution in water Sp. Gr. 2.0. The other end having been squarely cut is placed on the first and the two cemented on the roll before windup, by electric iron. After drying with iron edges are trimmed and a piece of parafine paper 6 x width of roll is placed top and bottom over mend.
Unwind and winding shaft of machine have brakes and speed of windup is 40 mm
Sketches of machines have been delivered W. R. Hope.
For badly wrinkled or stuck together cellophane a wooden 15½" collapsable wheel is placed over the windup of the machine and the badly wrinkled or stuck roll of cellophane is fed to collapsible wheel from a wooden stand.
Films that have become too dry for cutting, handling or embossing are vaporized by steam which rises from trough, through cloth, from a perforated steam pipe.

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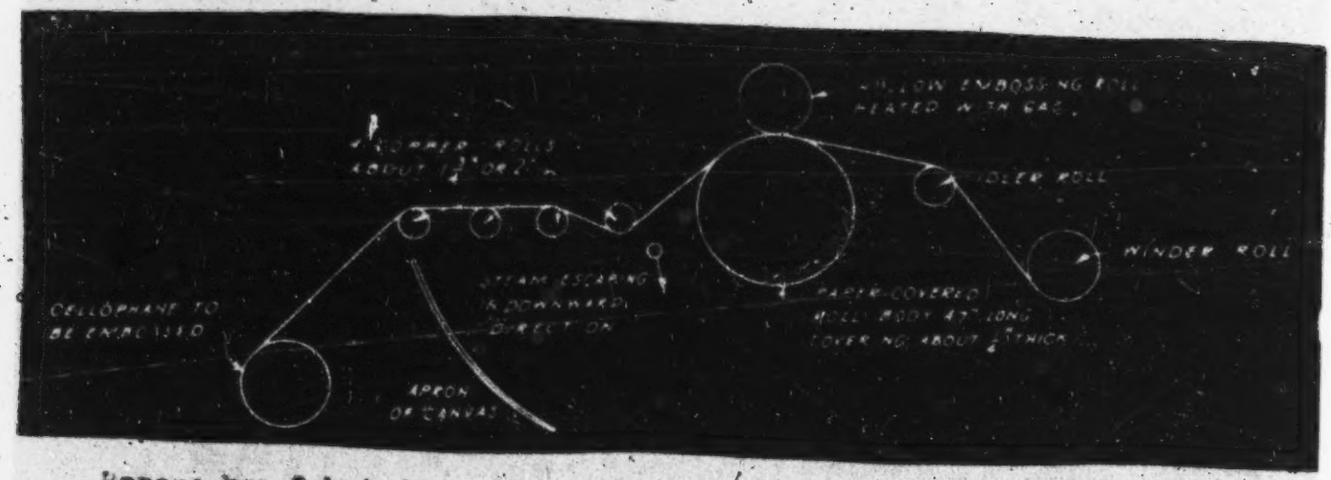
EMBOSSING MACHINE

See sketch and photo. sketch 3"



Bezons has 6 but 4 are regularly used. Best are made by Repiquet of Paris. Speed of machine runs 10-12 m per minute.
Pressure on engraved roll given only by weights shown in photograph, embossing rolls on top heated as required by gas to 120 -130 degrees C. Gas can be shut off from time to time during operation of machine. Never stock embossed cellophane, as pattern will vanish under pressure or the right temperature and humidity.
Best Cellophane for embossing is

.253 or .02 m
.400 or .03 m
.700 or .05 m

above 700 do not dry film so thoroughly at casting machine or thoroughly vaporize before embossing.
Always vaporize Cellophane before embossing.
For embossing use standard unbleached films except that the glycerine content must be 20%.
Copper smoothing rolls on front of machine must have wing nut brake control as well as windup and unwind; winding roll turns at 18 rpm.
Clean saber counterpart of embossing roll only with distilled water, dry smoothing, and wash with a cloth. Clean engraved roll not more than once a year with NAOH solution 6-10%; wash afterwards with distilled water. Protect counterpart or paper roll while cleaning the engraved roll.

A Repiquet machine costs 16000 fr. with steel roll not engraved roll and counterpart. Engraving costs 500 frs.
A small steel roll not engraved costs 2-3000 fr. with its counterpart.

In case upper roll become strained or counterpart is nicked wet lower roll fully and carefully with distilled water and allow machine to run idle with engraved roll on counterpartfor a day.

Engraved roll is of steel, counterpart of compressed paper. Smoothing rolls of copper, frame of cast iron.

Waste from embossing machine for both plain and engraved cellophane averages 4%.
One operator is required to a machine rate 2.7 -3.0 fr. per hour.

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EMBOSSING: Cont'd.

Always cover rolls when not in use.

Crown counterpart 0.3-0.4 mm. lengthwise as it gives better embossing.

A machine as above will emboss 4-5000 m/8 hours. It is better to have embossing machines to take care of the best demands as follows, as it takes one-half day to change rolls and there is danger of marring them.

1	Machine	for Silk and Linen	(4 rolls required)
1	"	" Taffeta	(2 rolls required)
1	"	" Chagr'in	(2 rolls ")

Mauve is not in sufficient demand for a machine; buy extra rolls.

We are advised to have three embossing machines for two or three casting machines.

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PRINTING

OF

SHEET CELLOPHANE

PRINTING OF CELLOPHANE:

The printing of Cellophane in France is done by a separate company; in other words, a master printer of bags shares in the profits of all printed cellophane sold.

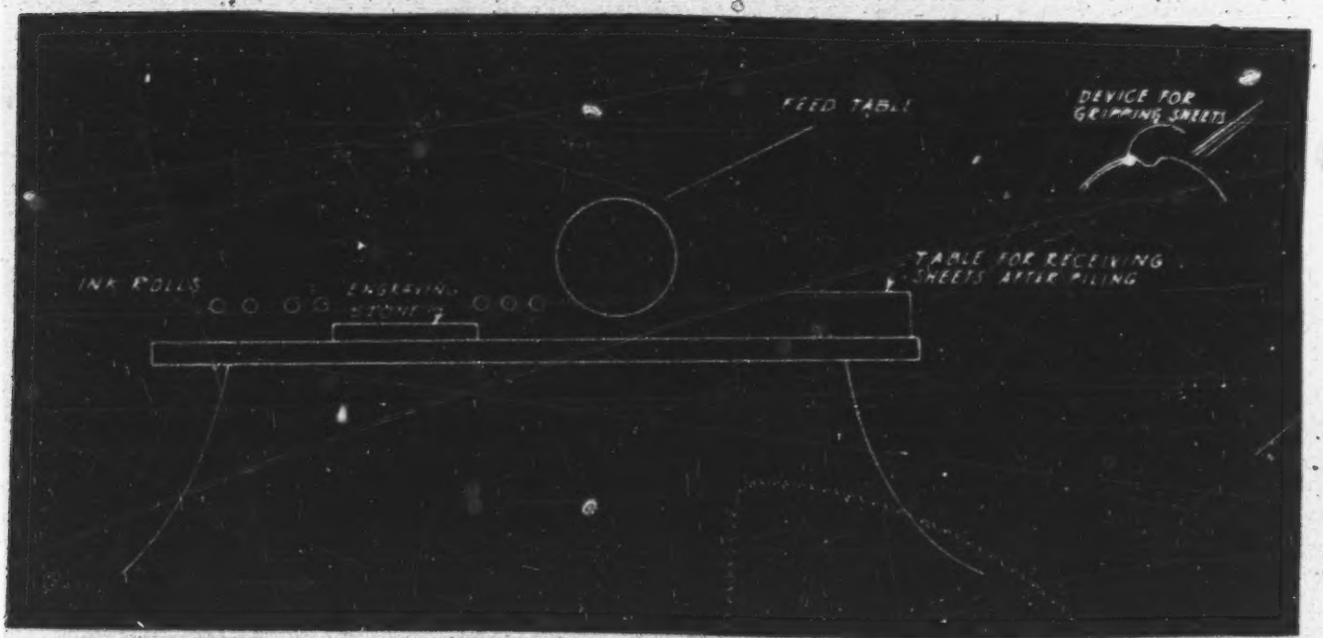
They have done some very wonderful work, printing in two colors on bags, transparencies, box covers, etc. A material in use is used, called "Teplecho." (Paris, Rue de Turnon).

One press can print 4000 sheets in 10 hours with one (1) man and three (3) girls. It requires 1½ hours to set up and get ready for printing. Sheets, after printing, are placed between blotters to dry; and, if cutting is necessary, are racked on metal pins and carried to the cutting room.

It is difficult to handle several color print work inasmuch as the temperature of the room, humidity, etc., changes from the time the first color is applied, and stencil work does not always match up.

This is a specialty that, if ever used in America, will require the careful detailed attention of a competent master printer.

All engraving is done on lithographing stone and the type of press used must be suited for engraved stone work. (See blueprint).



TRANSPARENCIES:

The design is printed on the thickness of cellophane desired and the sheet is then passed through a 10% gum arabic and water solution. The glue covers both sides of the sheet, which are piled on racks to dry, one sheet of blotting paper between each glued sheet of cellophane. Allow sheets to stand 3 or 4 days to complete drying.

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Transparencies may be in plain white or in colors; and, when fastened to glass, remain in position an indefinite time.

Presses are hand fed and must be equipped for printing from lithographing stems.

No detailed rates on force obtained as work is under supervision of Paris master printer.

CELLOPHANE CHARACTERISTICS:

Cellophane will absorb any odor that MgO will absorb.

Cellophane is grease proof and will hold oils or greases such as lard, olive oil, etc. indefinitely without detriment to the contained product.

The vapors of coffee or tea can be smelled through the cellophane, although these articles can be stocked without detriment, in it for long periods.

Should the article enclosed in cellophane contain water, the water will slowly seep through the cellophane. There will be no dropping from the cellophane as the seepage, under ordinary conditions, about equals the evaporation.

Jellies have been packed in cellophane containers and have been kept in normal room temperature perfectly satisfactorily. The top is sealed with paraffine as in glass jars.

It makes an excellent wrapper for lard and butter.

CELLOPHANE DON'TS:

Be careful that none of the substances used in glueing or wrapping have any water soluble oders as the cellophane will take them up. Tar paper causes cellophane to have a tarry oder and might cause customers to object. Such oders will sometimes vanish if the cellophane is opened sheet by sheet and the oder allowed to dissipated but it is well not to take a chance as the oder, once present, causes the customer to have a wrong opinion about cellophane. The very purpose for which cellophane is used, namely, the wrapping of candies, high grade toilet articles, tooth brushes, etc., makes it very necessary that an objectionable oder of any kind is not carried with the stock.

MACHINES FOR SPECIALTIES

USE .05 MM. FOR CELLOPHANE MILLINERY

A number of other cellophane products are made in the same department as the regular dyed and embossed goods. These require a variety of treatments, for which special machinery has been developed, to give the desired effects. These specialties are Sphinx, Metalline, Iriss, Velcutine, Straw, Gutta-Percha, Envelope windows and Bronze Checker Printing.

SPHINX:

"Sphinx" is the trade name for Cellophane with a silvery lustre. It is made by impregnating regular film with silver nitrate and reducing to metallic silver by means of pyrogallic acid. The film is lead from a roll through a silver nitrate bath containing: -

For "Sphinx" to be converted to "Iriss."

0.5 - 1%	$AgNO_3$	- 2 to 2.5%
10%	Water	- 10%
	NH_4OH	- to make alkaline (litmus)
89%	Alcohol (denatured)	to make 100%

The excess solution is removed by squeeze rolls, the film is dried, passed through a solution of pyrogallic acid in alcohol, 1 gm. per liter, through squeeze rolls and dryer. Both dryers operate at 50° C. It is said that the capacity of the machine at Bezons is 1000 meters per day.

METALLINE:

"Metalline" is simply dyed "Sphinx". The Sphinx is passed through a collodion dye solution and dried. Any alcohol soluble color is said to be satisfactory. The dye bath is a 2% collodion solution in ether-alcohol with as much dye as desired. Speed of machine is two (2) meters per minute.

IRISE:

"Irise" is a black iridescent effect secured by precipitating silver sulfide on cellophane. The film is passed through an ammoniacal alcoholic silver nitrate solution as for "Sphinx," the solution containing only 1 to 1.25 gms. $AgNO_3$ per liter, exposed to an atmosphere of H_2S for 3 to 4 minutes, and dried.

"Irise" may also be an iridescent effect in colors. This is secured by passing in a collodion dye bath on the same machine as for metalline. For "Irise," however, the collodion solution is only 0.7% and the trough containing it is continually shaken to give the "wavy color" effect. Speed of machine 1½ to 6 meters per minute.

[illegible]:

An imitation velvet made for millinery uses. It consists of a pile of artificial silk glued to a cellophane back specially prepared. The machine for making has a device for spreading glue on the sheet of cellophane and a rack of jointers, driven by cams, to arrange the short-cut artificial silk fibres into an erect position where they are held by the glue. Glue used -

[illegible] gm. gelatin. Allow to swell in
1250 cc. water and
[illegible] gm. glycerine. Then add
1000 cm. acetic acid and dissolve on water-bath.

STRAW:

A display product made by twisting a 15 mm. strip. Not made now because there is no market for it. Machine made.

CRYSTAL CHECK:

A 60% glycerine film rubbed with talc on both sides. Made in a machine with rotary brushes to apply the talc and brush off the excess.

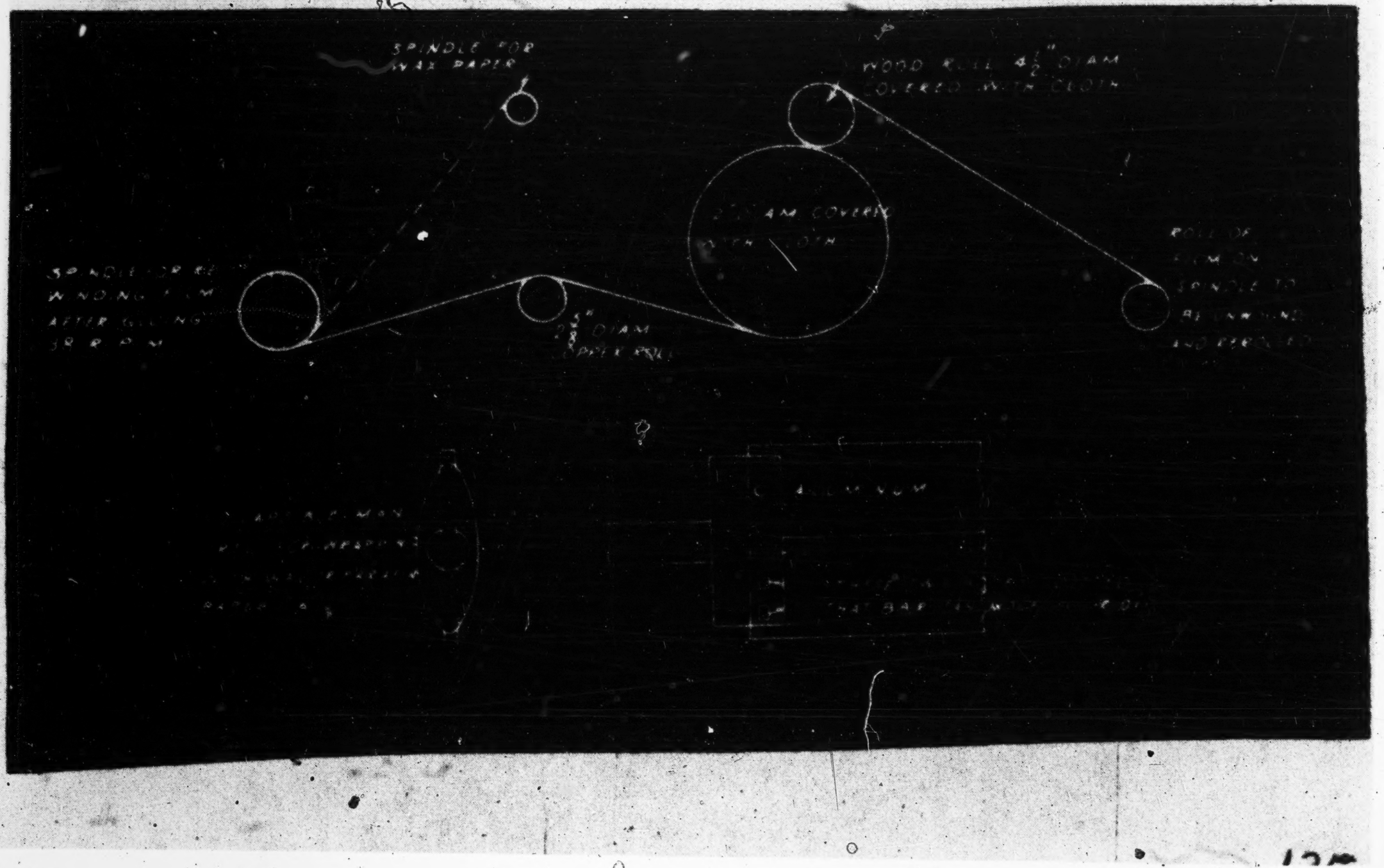
BRONZE CHECKER PRINTING:

This work is done on a machine developed from a standard engraved roll continuous printing machine. The film, 50 cm. wide, is fed from a roll to the machine which prints the checker design in yellow. It then passes directly to a specially developed attachment which applies bronze powder and brushes off the excess. The bronze checker printing is done on both plain and dyed cellophane. The ink used is from -

Ch. Lorilleux & Cie, Paris.
"Vordant Imprimerie Lang."

Used also for gluing and measuring.

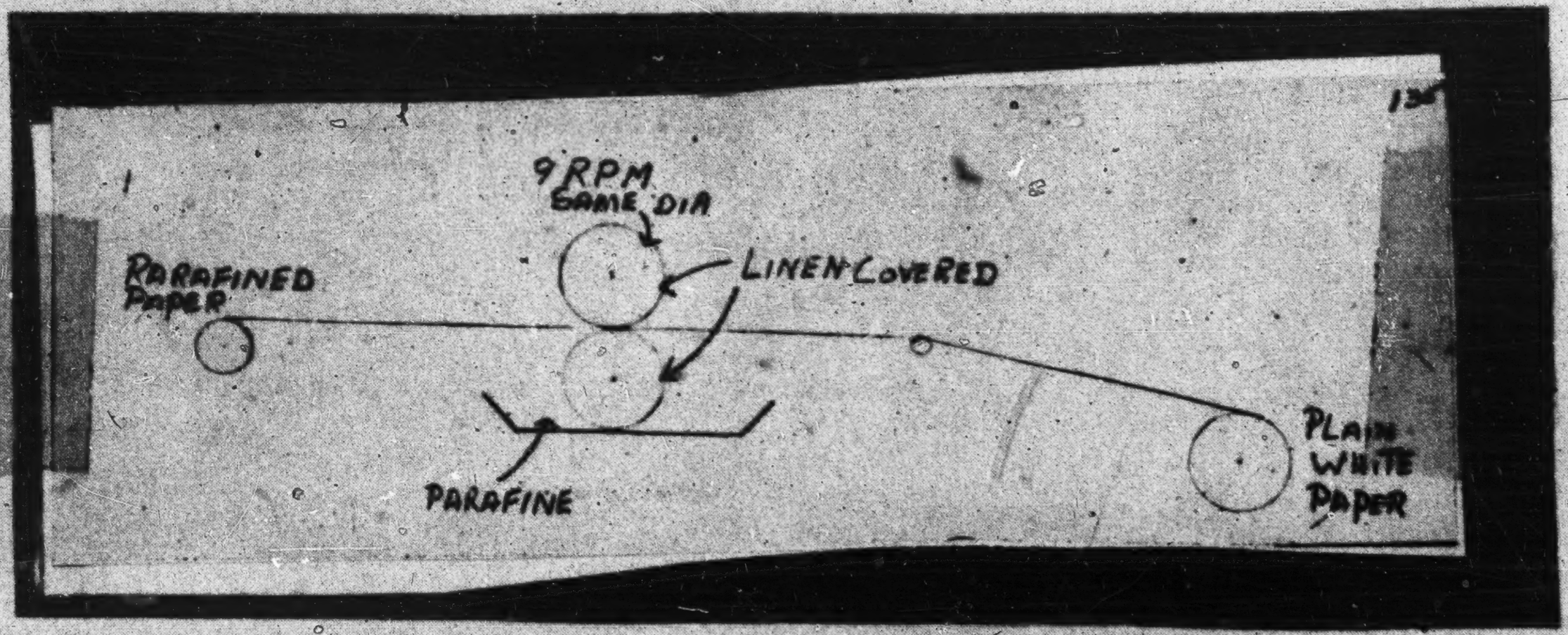
See sketch.



PARAFFINE PAPER MACHINE:

This machine is used for coating paper with paraffine. Use paper 100 cm. in width.

Keep paraffine by steam coil, double boiler method, at 80° C. Do not let boil under any conditions.



PHARMACEUTICAL MACHINE:

Used also for glueing and measuring.

See sketch.

Use film 40-50% glycerine and always wrap in lengths only of 4-5 meters. Always place paraffine paper between films.

A counter travels in the [illegible] roll of this machine and is used where torn rolls are needed as well as for wrapping pharmaceutical film in paraffine paper.

Pharmaceutical film is used for bandages and for covering the top of drug bottles.

ENVELOPE MACHINE:

A special machine for glueing cellophane to window envelopes will make 300 envelopes per hour. Machine cost 20,000 francs and Bezons will sell, as France does not allow the use of window envelopes.

AUXILIARY DRYING MACHINE:

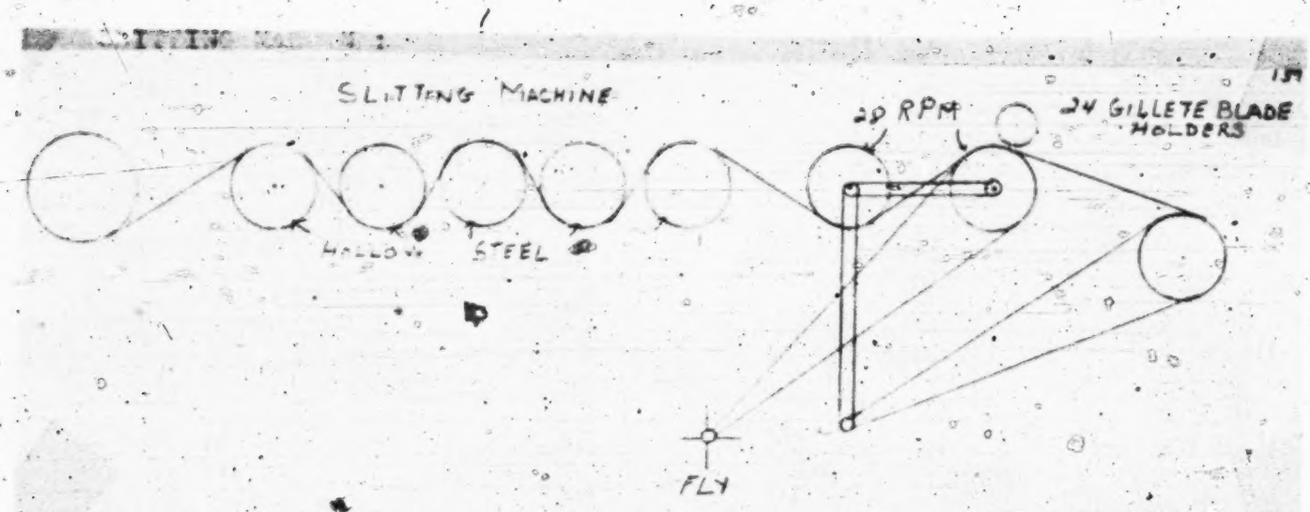
When a new casting machine is first started up, until it is thoroughly broken in, there is not to be cellophane produced in excess that is improperly dried, or contains heavy strips that are not evenly dried.

If the glueing machine is not engaged in glueing or light color dyeing, the film mentioned is passed through it and properly dried. Should the rolls be of short pieces, it pays to dry them through a small auxiliary drying machine as it saves labor and frees the glueing machine for more profitable work on long rolls.

See Sketch.

The glueing machine requires three men to operate it, while the auxiliary dryer requires part time of one man.

Heat large roll with hot water and use temperature as for dryer end of casting machine.



Machine used principally for slitting cellophane into ribbons of varying widths for millinery purposes. Cellophane of no higher than 14% glycerine content should be used for slitting as it tears more easily. If grade of higher glycerine content is present, run paraffine paper through machine with the cellophane so that it impregnates each ribbon.

Machine above will cut to plus or minus 1" in width or multiples of 1".

Main cutting wheel on which Gillette razor blades operate is made of separate discs with a cutting slot every 5/16" apart. Slots are just wide enough for Gillette blades to operate in. Machine occupies space about 6'0" long x 5'0" wide x 4'0" high and is belt-driven with quick trigger release clutch.

Emil Suters, Erbem, Leem (Aargau) Switzerland, makes slitters similar to these, but Mr. Brandenberger has located a machine shop in Paris from which the first slitter for America will be forwarded.

One Gillette blade will last two to three days steady work.

Capacity of slitting machine - 110 Kg. 253 per 8 hours

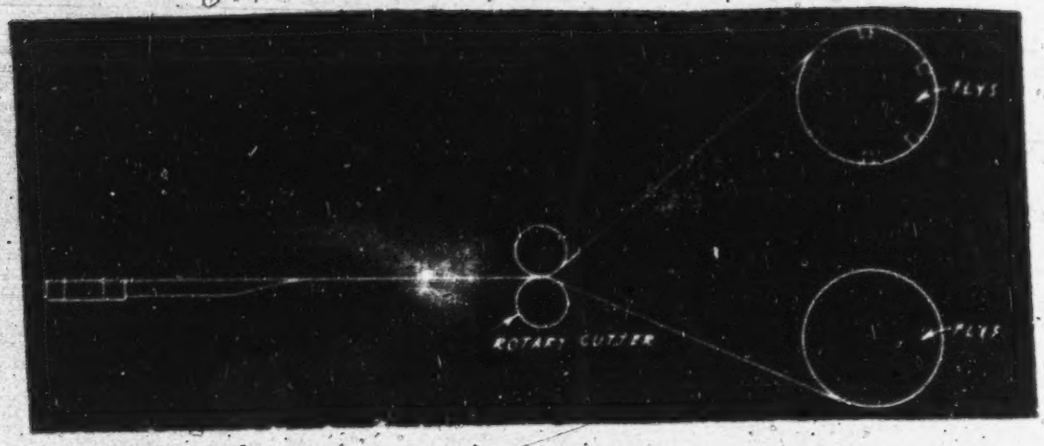
For 700 the amount cut will be correspondingly larger.

Inspect all cellophane rolls for slitting very carefully. If all fatty acid, they will be too brittle and will tear very easily. The same trouble will take place if they have too little glycerine - less than 14%. If too much glycerine is used in film, it will cut and work easily, but the product will stick together after cutting. 265 and 400 are the worst thicknesses to stick together. Above these thicknesses, cellophane rarely sticks. Sticking is also due to light winding.

Always steam millin ry before cutting operator of this machine does other work. He might run a vaporizing machine or embossing machine. Work on slitting machine only as required. Rate - 2.7 to 5.0 francs per hour.

ROTARY [illegible]

[illegible] belt.



Are best for 1, 2 and 3 mm. or multiples of these. Five (5) mm. and up, [illegible] are best cut by gillette blades.

Speed of material in these machines is approximately 25 meters per minute.

[illegible] THE MACHINE:

This takes a 25 mm. strip and cuts into 25 strips of 1 mm. each above. It only winds onto flys with no crossings and contain all yards possible. [illegible] in Switzerland and developed at plant.

Speed of material 25 - 30 meters per minute.

All this material sold to millinery [illegible] in hank form and in strip form but on spools.

Millinery trade requires 45 mm. strip, which is cut into 2, 3 and 4 mm. strips. (253 and up wide).

Machine for spooling from skein strips of silk similar to Buffalo spooling machines, only runs very slow and entire spool moves and no take up bar.

[illegible] MACHINE:

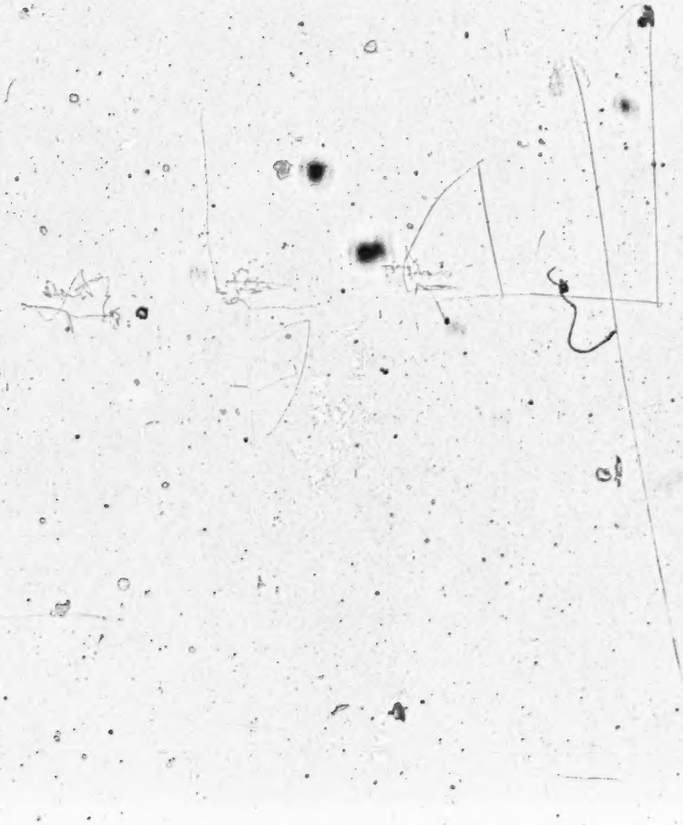
Some rolls are re-wound for inspection purposes only and to combine several small rolls into one large roll.

Machine for re-winding strips that are in rolls. Rolls that are re-wound are soft or contain laces or are otherwise faulty. This is a hand machine and simple. See sketch.

The film in this winder is glued to cardboard core by means of gum arabic glue, while the film is itself glued with zinc chloride glue.

Fasten end of re-wound pellicule by paper gummed star 1" in diameter.

Waste represents 1 to 1% of total re-rolling and stripping put through room.



MISCELLANEOUS PRODUCTS

GASOLINE [illegible]:

This manufacture is carried on by a separate company. See sample. Product used principally for gasoline-filling stations, as cellophane is not depreciated by gasoline.

MANUFACTURE:

1st - 5 rounds of light weight linen are used on a galvanized wire spirn core.

2nd - 10 rounds of 400 cellophane [illegible] are next added.

3rd - A string is tightly wrapped around the cellophane to cause it to mould the wire core.

4th - String is removed and 4 [illegible] of [illegible] or [illegible] [illegible] is next added. This should be cemented at every turn.

5th - A galvanized wire 1/[illegible] in [illegible] or larger is tightly wound over [illegible] on the mould [illegible] by [illegible].

This hose is made in sizes up to 4". Wire core and wrappings are varied as to size of pipe. Hose has long life and it is not affected by grease; has been in use at gas-filling stations a year and no [illegible] account necessary.

BAGS:

Use [illegible] or [illegible], plain or colored.

Form 10 waste on cellophane.

[illegible] Bobst press like in [illegible] with [illegible] dies manufactured by Chretien, [illegible]. [illegible] sheets can be cut at one time.

One man, one hour, will cut [illegible],000.

Cycle of Bobst - [illegible] sec.

Use waste for bags, [illegible] second-class.

One man cuts all bags made at Bezons or [illegible],000,000 per month.

The pattern for a bag is determined from customers' specifications by sampling department. Bags made with or without flaps.

Cut cellophane is first glued on three edges and folded about a mandrel of hard wood.

Sketch.

Glue used for glueing

1000 g. Gelatine

5 liters H_2O

1500 cc. $CaCl_2$ Sol. - 36 B. at 15° C.

Glue is made as follows:

Sheet gelatine standing on end fills a 14 qt. G. I. bucket. Bucket is filled half full of water. Gelatine becomes soft. Bucket sets in a tub of very hot water - 80 - 90° C. and kept there until gelatine is melted, then proper proportion of $CaCl_2$ is added.

In winter time - 1500 cc. of $CaCl_2$ is necessary; in summer - 1200 cc.

$CaCl_2$ is melted in an earthenware crock, or iron bucket, by pouring cold water over it and letting dissolve. Solution is tested by hydrometer and is diluted to proper strength.

BOXES:

Boxes are made of #1500, or heavier, as desired.

One (1) Bobst machine, type K B1T, serial #922, No. 6832, cuts cellophane to proper width and scores both ways where bends in box come.

Another Bobst machine cuts slits on ends of box body or cover. This is a straight punch. Bobst machines are new and production is not known. The first machine is supposed to mark and cut 25 meters of cellophane per minute.

Box, after being marked and cut, goes to a table where three (3) girls form a gang; two (2) bend and hand to girl riveting. The bent tops and bottoms are riveted with 3/32" or smaller, aluminum rivets by a Deude Riveter, [illegible] de Temple, Paris. Machine costs plus or minus 375 francs.

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600 tops and 600 bottoms, or 300 boxes in 8 hours.

TUBES:

Top and body of tubes formed around brass cylinders. Small slits down sides so tube will slip off easily. Top mandrel is 3/4 meters larger than bottom.

Two (2) girls, a crew, can glue and count 500 tubes a day. Glue used for cardboard top and bottoms, 1/8" thick, is ordinary stick sheet glue, softened.

For glueing cellophane together:

1000 g. gelatine
25 liters H_2O
100 cc. $CaCl_2$ 36° B = 150 C.

One (1) girl extra can dip (both ends) 2000 tubes a day. Collodion or red eye is used.

Glue pot is in three compartments and kept surrounded by hot water.

First compartment (water with glue brushes)

Second - Glue for tube tops and bottoms

Third - Glue for cellophane

TUBES - PACKING:

Tubes are packed in cartons with cardboard between each layer. Number depends on size of liters.

SACKS - PACKING:

Packed in bundles like sheet cellophane.

"V" [illegible] - #253:

Sketch.

Always place a strip of paraffined paper inside. It allows one to open sack easily. Strip 1" wide and depth of bag.

One girl, a crew, can make and count 12 - 13000 in 8 hours. These are small sacks; large sacks - 1 girl - 10,000 in 8 hours.

Cover all tables on which glueing is done with the black unlinened wrapping paper used in wrapping room.

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Glues used in various operations:

For [illegible] cellophane on rolls, on vaporizing machine, [illegible]

$ZnCl_2$ Solution in H_2O - [illegible] gr. [illegible]

Press pieces together with hot iron.

For Gluing Machine:

To make [illegible] sheets.

7 gm. Gelatine

7 " Glycerine

[illegible] 100 cc.

[illegible]

[illegible]

5000 gm. H_2O

1200-[illegible] cc. $CaCl_2$ Solution at [illegible] Baume:

Amount of $CaCl_2$ varies with season. Cold weather - use heavier [illegible] cc.

For [illegible]:

1000 gm. Gelatine

5000 " H_2O

100 - 400 cc. $CaCl_2$ Solution at 36° B.

For backing Transparencies:

25% Gum Arabic

10% Glycerine

65% H_2O

- or -

15% Gum Arabic
3-4% Glycerine
81% H_2O

Glue for Velcutine:

300 gm. Gelatine - allowed to swell in

1250 cc. water and

5000 gm. of glycerine. Then add -

1500 gm. acetic acid and dissolve in n°water [illegible].

[illegible] bag-making [illegible], consisted of [illegible] and [illegible]. It was made up very thick. Bags made by hand are better, as machine made cement together. Stock used in bags [illegible] or hand made, is .02 mm. or .03 mm.

CLAIMS

Claims from dis-satisfied customers add 1% to the basic cost of production. The Branch divide the total cost of producing cellophane for a monthly period by the kg. of cellophane made per month and to [illegible] 1% for claims.

WASTE

CASTING MACHINE ROOM:

From casting hopper of casting machine to wind-up reel at end of casting machine dryer, the waste equals 10% fiber viscose supplied the casting hopper. The dryer of the casting machine alone causes a waste of dry cellophane of 20 Kg. per day. This is caused by broken film and is partially reclaimed in the Smoothing Room.

DYEING MACHINE & DRYER:

As high as 8% waste is produced. Average for a monthly period equals 4 to 5% waste.

EMBOSSING MACHINE:

Average waste is 3%.

SLITTING MACHINE:

Waste runs as high as 20%.

WINDING DRUMS & PRELIMINARY CUTTER, COUNTING & INSPECTION:

Average total waste 1% - 2%.

About 10% second choice is developed by inspection. This sells for 20% less than first choice.

One (1) to 2% third choice is found, but this overlooked as it is compensated for by the 20 Kg. of Cellophane per day obtained from the dryer of the Casting Machine.

TRIMMING SHEETS TO SIZE:

For trimming standard sheets to size as demanded by American trade - i. e. 100 cm. by standard width - a waste of 7 to 8% is developed.

For trimming to sizes having an area of more than 10 square meters per 1000 sheets - waste runs as high as 10%.

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square meters per 10[illegible] sheets - waste runs nearer 15%.

BAGS, [illegible]:

[illegible] of 10% is averaged in above manufacture.

[illegible]:

Average total waste of both rooms is 10%; of this Rezons reclaims about 5% through Smoothing Room and Waste Machine.

DISCS & OVALS:

Circular discs of Cellophane are cut through the use of steel dies as shown on the back of cutting machine blade sketch. Bobst Press is used. See photograph, Exhibit [illegible]. Die will cut 500 sheets of .02 at one time. Cycle of press head is four (4) seconds. The press does not do the punching. All it has is an upper plate that travels up and down vertically. The press operator inserts over the cellophane to be cut, a die of the proper size and shape, and the press plate on its downward travel, forces die through cellophane. The cut cellophane is easily ejected from the die by hand. Cellophane to be cut is placed on a piece of cardboard similar to that used in packing on sheets of cellophane for shipment. Stroke of press is adjusted so that the cardboard is cut with the cellophane.

Present method of cutting is simple and positive. Mr. Brandenberger and his assistants have no suggestions as to improvements.

Dies are made in Paris and Chretien by Karl Krause, Liepzig, Germany, and are obtainable in desired sizes. It is quite an art to make one. The steel is special tool or die steel and has a special temper for cellophane. Dies are made of a single piece of steel that is welded about a circular mandrel and cutting edge drawn out. It is next tempered.

Sketch.

A Bobst press Catalog has been secured.

A Bobst Press will cut from 300-400,000 special designs in a day of eight (8) hours. The Juring catalog shows a similar press, Exhibit "F". This press could probably be duplicated without trouble in America.

Dies are sharpened about every four (4) months. Dies under 3" diameter are sharpened at Plant. Larger ones are sent to

grinding specialist. They are placed on a [illegible] which reverses against a thin carborundum stone.

Lubricate dies 5 to 8 times a day with paraffine block. Be careful of cutting edges and do not sharpen any oftener than necessary as it draws temper. Charge for dies is 1 fr. 10% per inch of cutting edge circumference for dies 5" and up in diameter; 1 fr. 40% for smaller ones. Dies most used are [illegible] for wrapping spot. It is better to have [illegible] hold.

Charges for cutting by dies are based as follows:

The square of cellophane actually required for the circular disc - i. e.

plus 35% for diameter of 1 to 3" and plus 20% for [illegible] - 8 to 12" diameter; sliding scale between. For ovals - the same principle applies, except 25% is added to cellophane [illegible] on cuts having flat arcs.

Sketch.

The average addition to the cost of cellophane squares is 40-50% for sizes most used - 4½" - 5". The labor on disc work in [illegible] is figured at 1/2 fr. per 1000 discs.

PRINTING ON DISCS:

5% waste material is caused by printing on discs, such as transparencies.

COSTS, PRICES & PRICING

CELLOPHANE AT [illegible] OF CASTING MACHINE:

Bemens arrives at a [illegible] cellophane at end of casting machine dryer as follows:

The total expenses for the entire cellophane plant (including cutting, dyeing, glueing and embossing, as well as inspecting, storing, wrapping, [illegible], [illegible] and sales) is divided by the production of cellophane at the end of the casting machine dryers and the unit cost per kg. obtained is considered basic. This method of computation is always on the safe side and gives leeway. The costs of producing various thicknesses of cellophane or cellophane from different baths, are not kept separately.

To the basic cost given [illegible], [illegible] claims, certain administrative expense and a profit of at least [illegible] (depending on the quality, etc.) and a selling price for cellophane per kg. or rolls as obtained. By a predetermined factor, depending on the thickness of cellophane, the price per kg. is readily converted to francs per square meter or multiples thereof.

A roll of #253 cellophane leaving the dry end of the casting machine dryer in being wound about winding drum, passed through preliminary cutter, counted and sorted will waste 1%. This is burned. The counting and sorting develops 10% second choice and as this sells for 20% less than first choice, depreciation in stock equals 2%. The third choice developed by inspection and counting equals 1-2%, and this sells for [illegible] less than first-class cellophane. Depreciation in stock equals 0.3%.

If a piece of cellophane [illegible] of the casting machine dryer be called a unit of 100, should be in stock travel over the winding roll, preliminary cutter and be inspected and counted, [illegible] would have a factor of [illegible] to add to the basic price for waste alone plus the labor unit involved.

For trimming sheets from the preliminary cutter to standard or [illegible] size, the [illegible] to the [illegible] price of cellophane at the end of the dryer casting machine. This is not sufficient as the waste runs to 7 - 8% and no labor item is taken care of. Instead of 5% an addition of 10-18% should be made.

For trimming sheets from the preliminary cutter into sizes having an area of more than 10 square meters per 1000 sheets, 10% is being added in France, plus selling price, at end of the casting machine dryer. This is insufficient as the waste frequently runs to 10%. The addition should be 15% as this would allow 5% for labor.

In cutting sheets from the preliminary cutter into sizes having an area of less than 10 square meters per 1000 sheets, [illegible] is added to film selling price at end of casting machine dryer. This allowance is sufficient to take care of waste and labor.

At an example:

Determine addition to be made to selling price of cellophane #253 at end of casting machine dryer for an order of cut sheets having an area of less than 10 square meters per 1000 sheets.

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For small colored embossed sheets, trimmed, 50% is added to cost of plain film at end of casting machine dryer. In large, colored embossed discs, 3% is added.

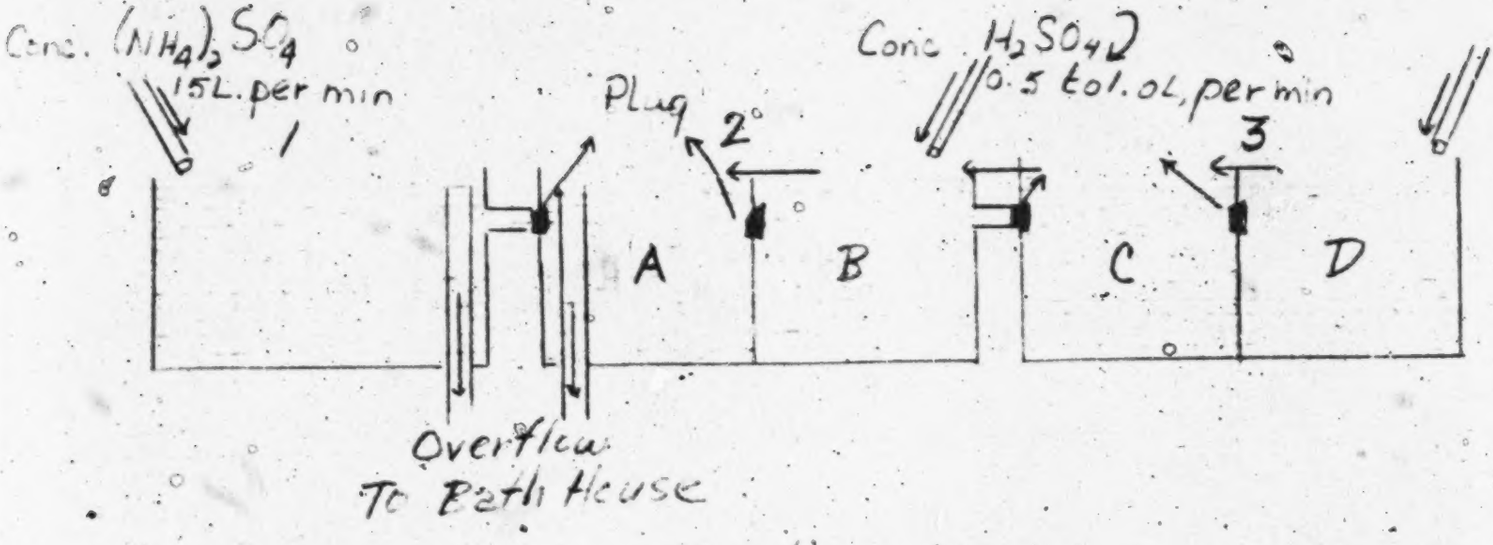
For cutting large, colored, embossed cellophane sheets, add 25% to basic dryer price.

For transparencies, 50 fr. per thousand should be added to cover glue cost alone.

A profit of at least 35% is added to all final costs.

The cost of cellophane produced by specialty machines, such as Metallina, Sphinx, Iris, is determined by time study of operators.

A copy of selling prices of Bozons for different cellophane articles manufactured there is appended in Exhibit .

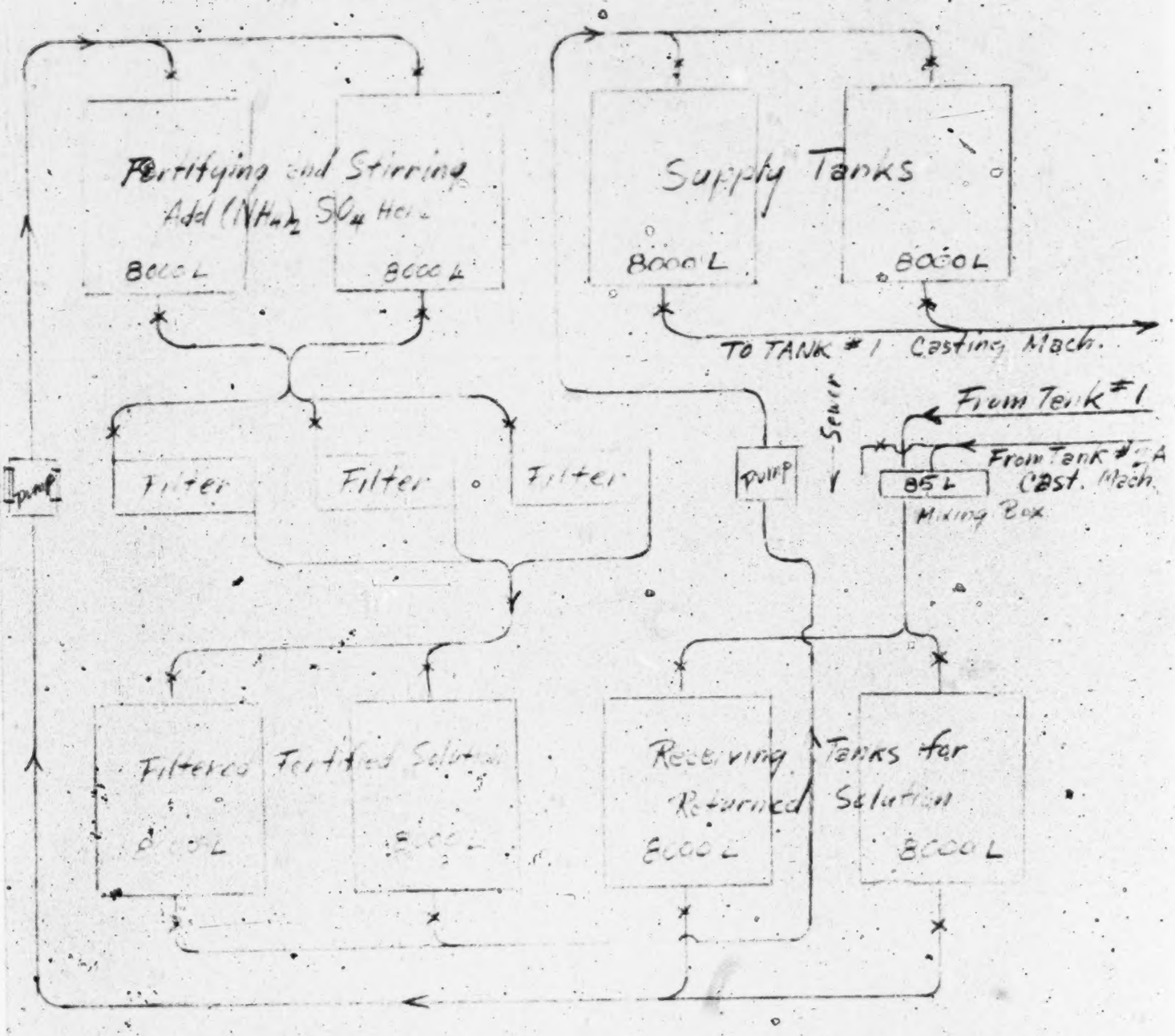


Casting Machine
Arrangement of First 3 Tanks and Solution Flow,
Ammonium Sulfate Bath.

151A

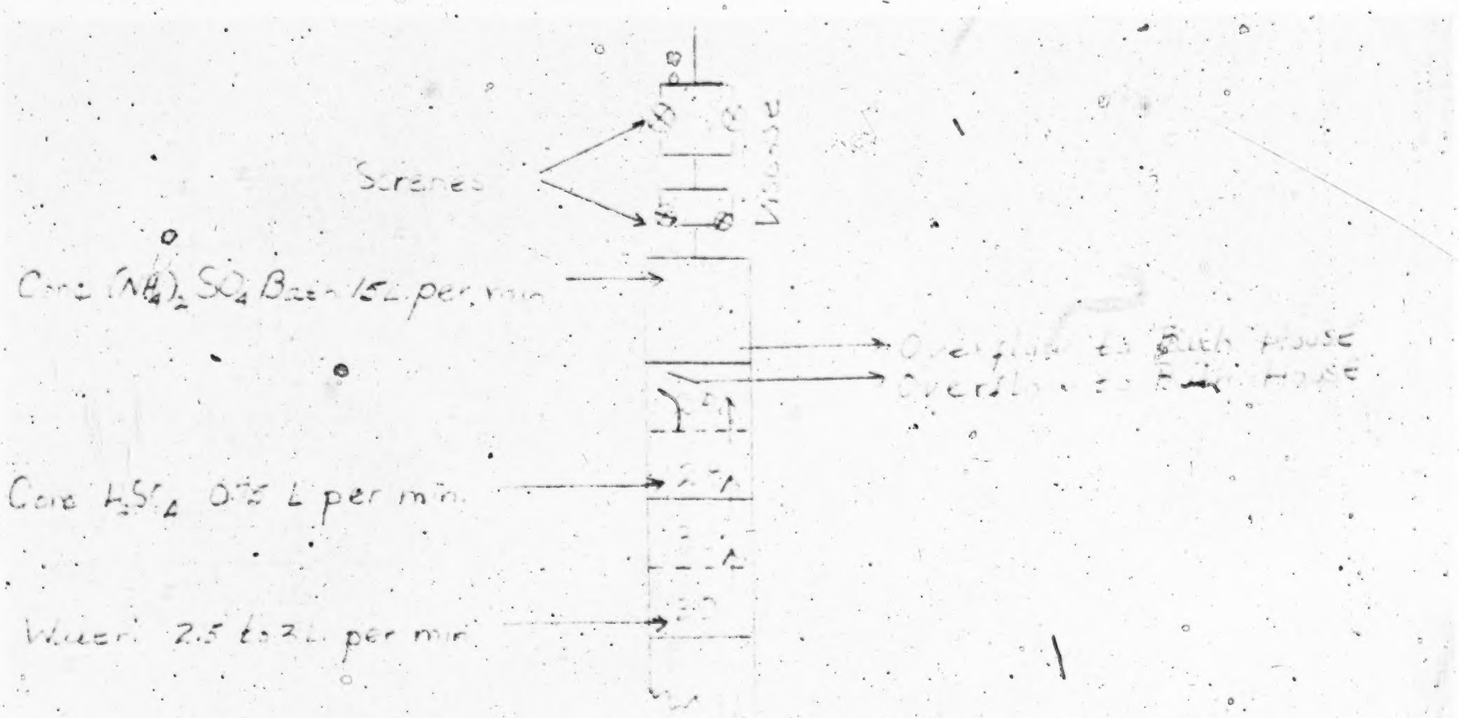
151B.

$(NH_4)_2SO_4 - NA_2SO_4$ Bath

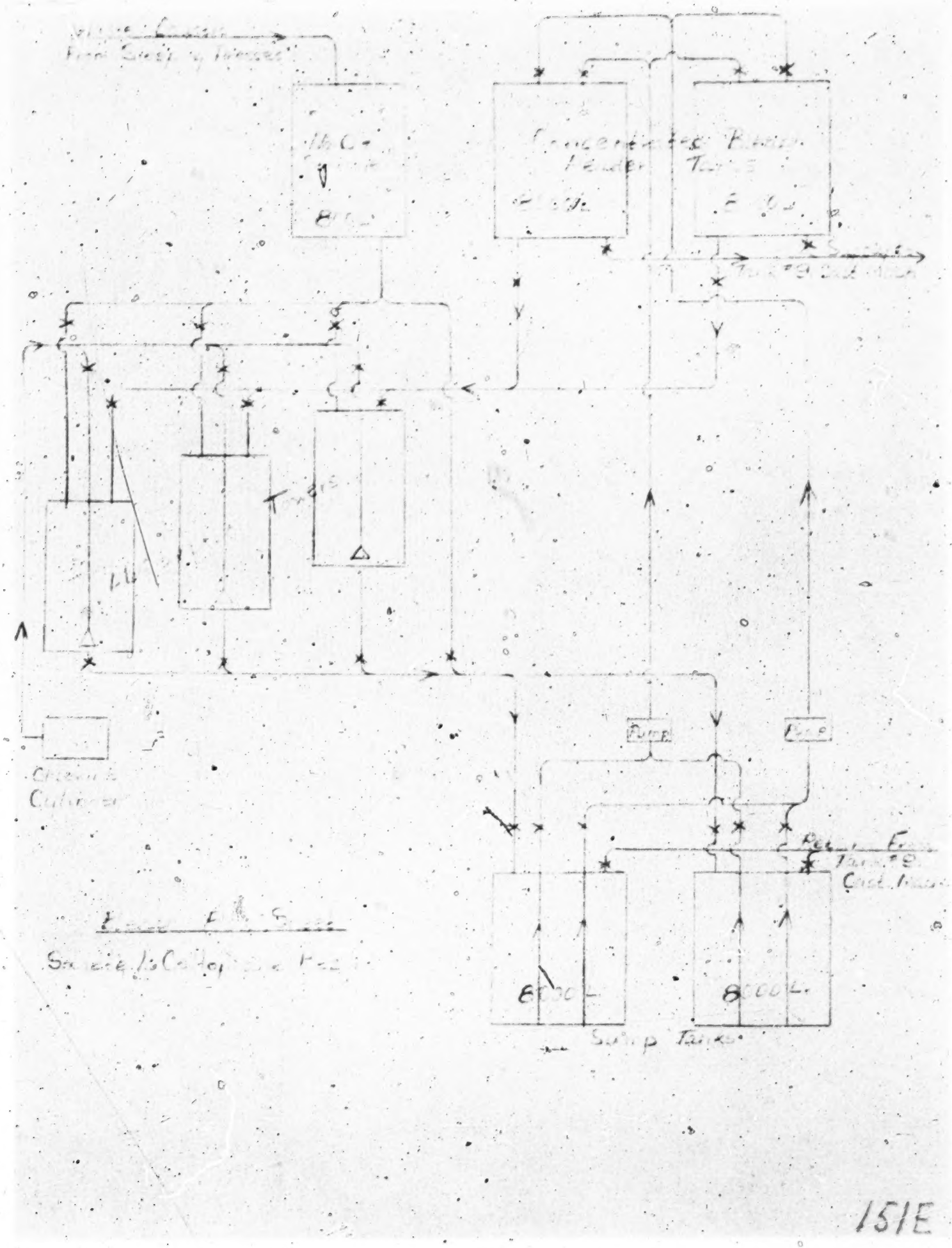


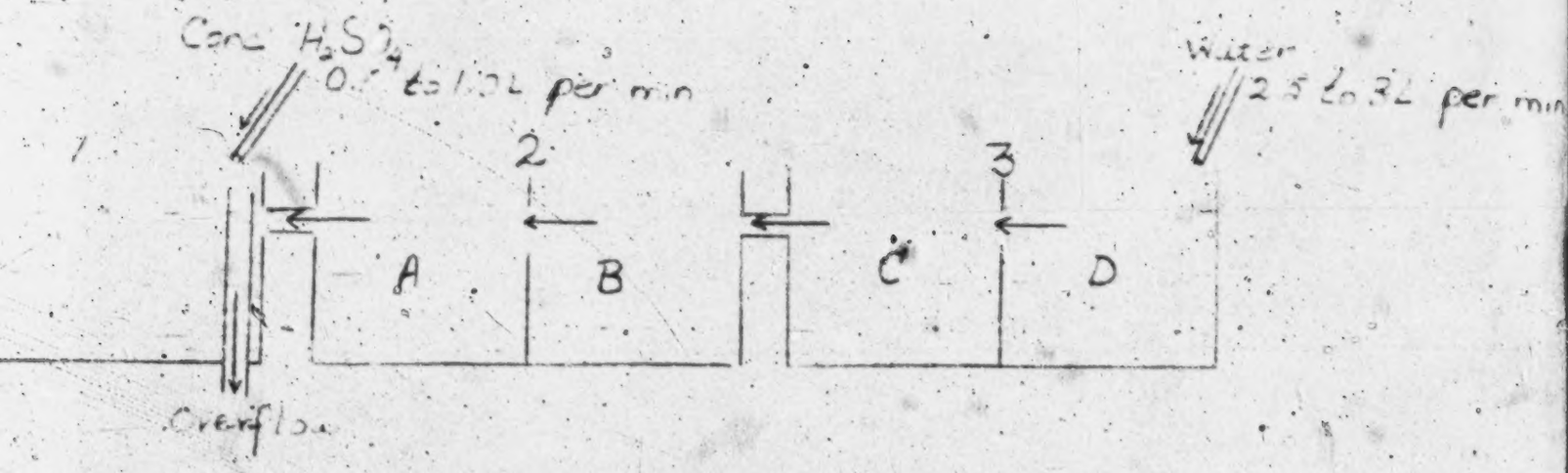
Ammonium Sulfate Bath Flow Sheet
Societe à Cellophane Bezons

157C


Screens
Core $(NH_4)_2SO_4$ Base 15 L per min
Overflow to Bath House
Overflow to Tank House
Core H_2SO_4 0.75 L per min
Water 2.5 to 3 L per min

1510

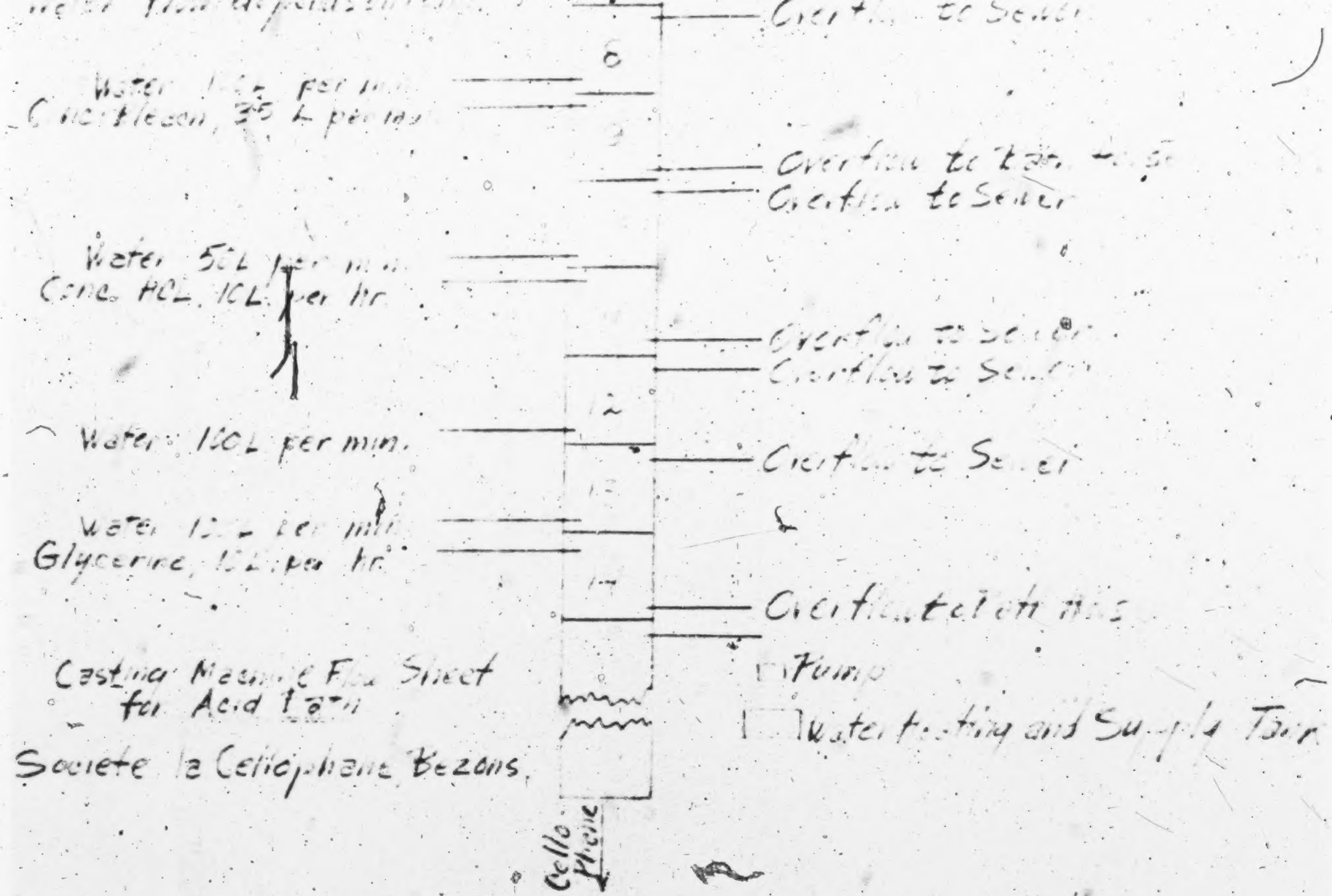

Pump
Pump
151E



Casting Machine

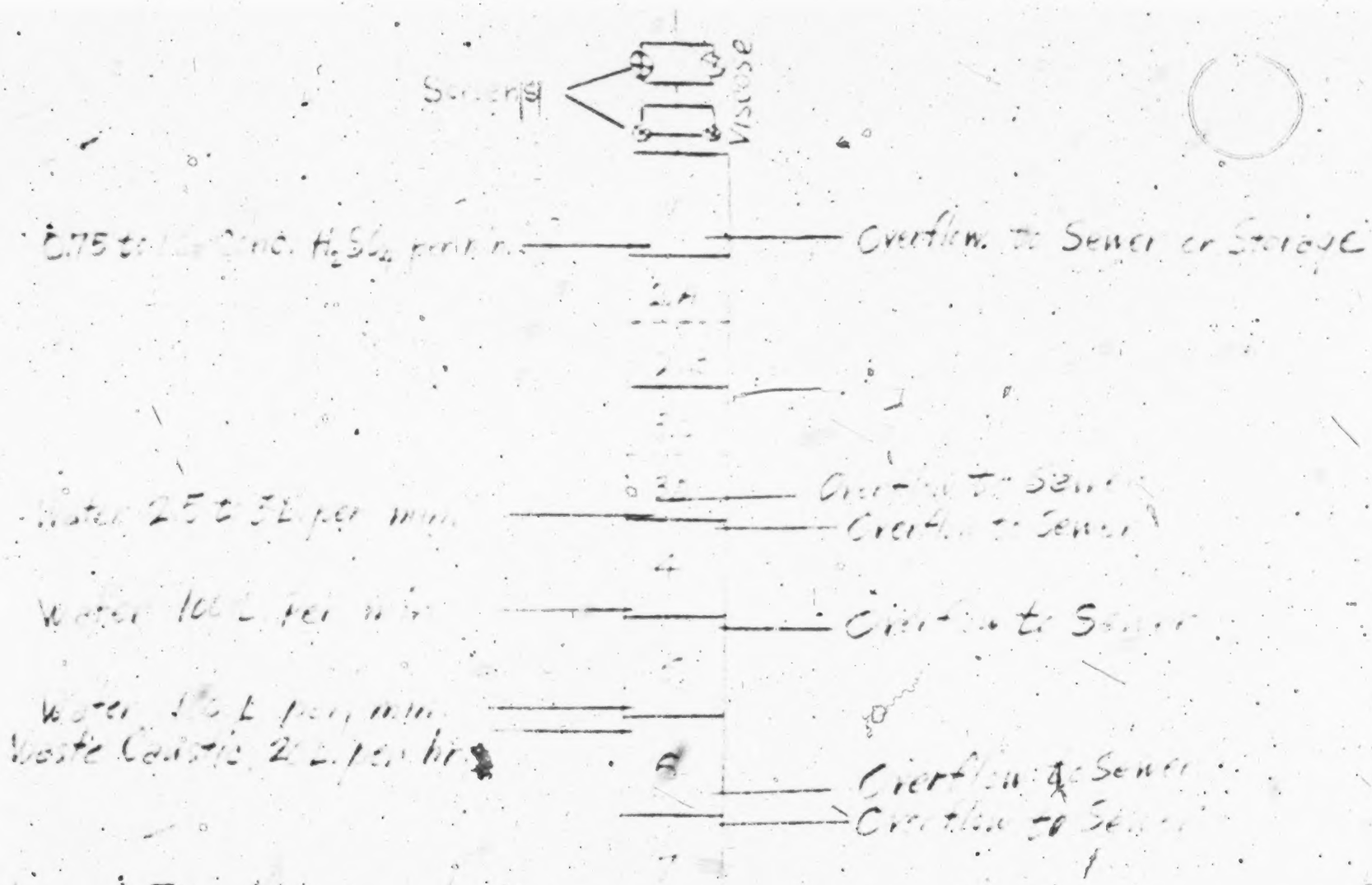
Arrangement of First 3 Tanks and Solution Flow Path

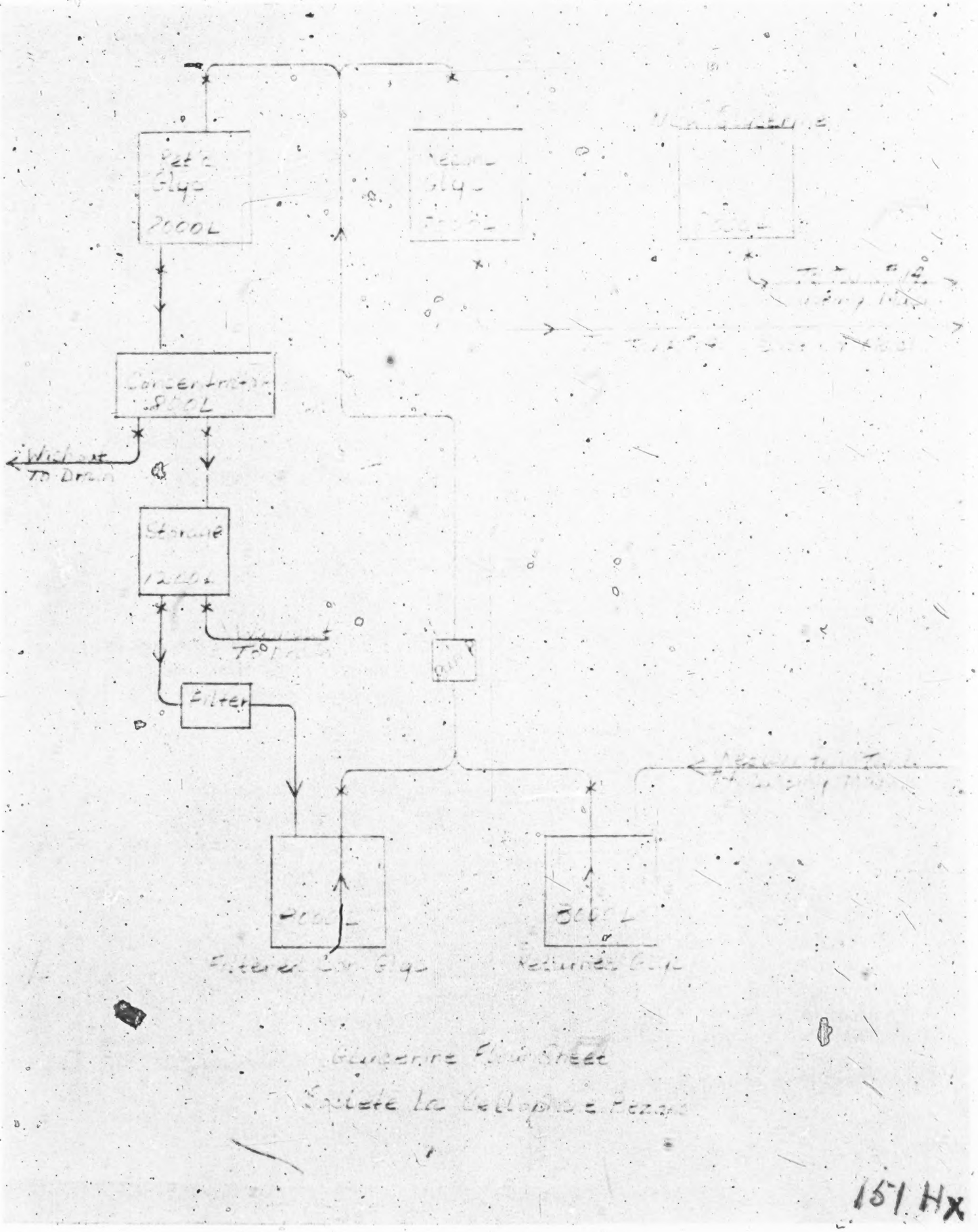
1517



Casting Machine Flow Sheet for Acid Bath

Societe la Cellophane Bezons.


Screens
Viscose
Overflow to Sewer or Storage
Water 2.5 to 3 L per min
Overflow to Sewer
Water 100 L per min
Overflow to Sewer
Water 100 L per min
Waste Caustic 2 L per hr
Overflow to Sewer
Overflow to Sewer



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